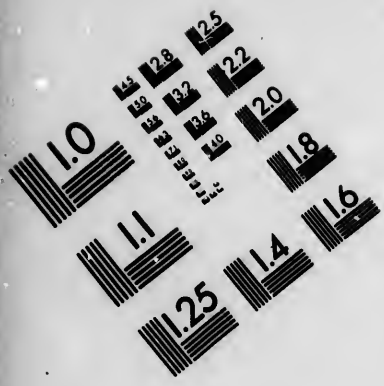

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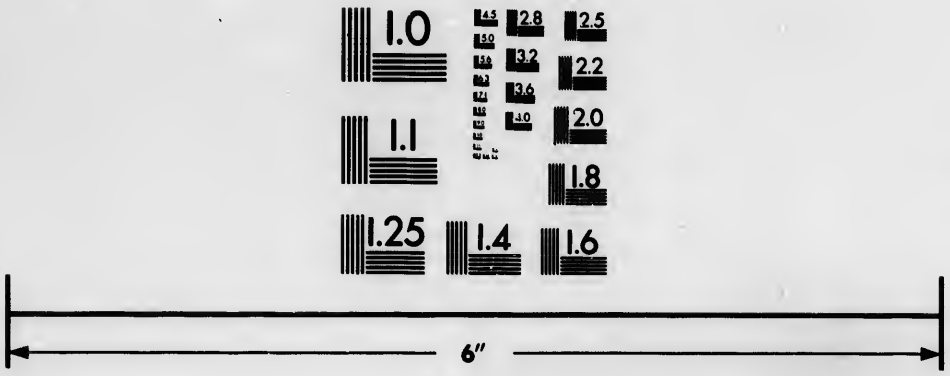

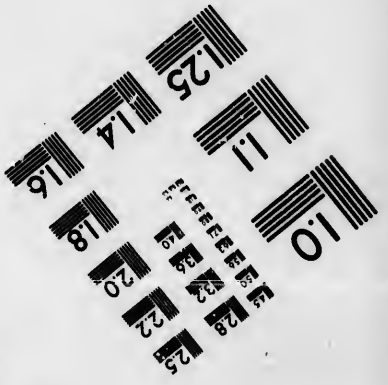

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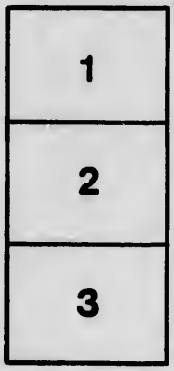

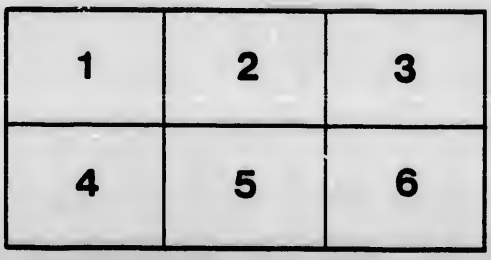

KEY

TO THE

ELEMENTARY ARITHMETIC;

CONTAINING

The Solution of nearly all the Problems.

BY

JOHN HERBERT SAGUEN, M.A.,

MATHEMATICAL MASTER, AND LECTURER IN CHEMISTRY AND
NATURAL PHILOSOPHY, IN THE NORFOLK SCHOOL
FOR DEEPER DRAINS.

PRINTED AND PUBLISHED BY JOHN LOVELL,
AND SOLD BY R. & A. MILNER.

Sunday:
R. & A. MILNER, 80 KING STREET EAST.
1851.

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1861.

PREFACE.

The following work is intended chiefly for a numerous class who are unable to devote their time to attendance at school, and on that account it was thought better to supply the student with the solutions of nearly all the problems in the Elementary Arithmetic. It may also be useful to teachers whose time is so much occupied in the multifarious duties of the school-room as to prevent them devoting to some of the problems as much time as they might otherwise demand.

TORONTO, November, 1861.

CONTENTS

CONTENTS.

KEY TO ELEMENTARY ARITHMETIC.

EXERCISE 1.

1. 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100.

2. 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200.

3. Twenty-seven; one hundred and sixty-four; nineteen; ninety-one; one hundred and seven; seven hundred and eighty-nine; four hundred and twenty-six; nine hundred and ninety-nine.

4. Sixteen; thirteen; twelve; sixty-one; thirty-one; twenty-one; four hundred and nine; seven hundred and seventeen; eight hundred.

5. 28, 517, 11, 65, 209, 40, 19.

6. 137, 906, 71, 807, 250.

7. One hundred and sixty-three; four hundred and three; seven hundred and one; eight hundred and eight; nine hundred and seventeen; eight hundred; seven hundred and eleven.

8. 79, 840, 711, 416, 505.

9. Nine hundred and nine; eighty-one; seventeen; one hundred and eleven; six hundred and six; five hundred and ten; one hundred and seventy; nine hundred and nineteen.

10. 59, 17, 71, 19, 940, 61, 412.

EXERCISE 2.

1. Seven thousand and forty; eight thousand one hundred and one; eight thousand and nine; four thousand and seventy; eight thousand and nineteen; six thousand one hundred and eleven; ninety-six thousand and three; eight millions six hundred and seventy-four thousand five hundred and sixty-seven.

2. Ninety-one millions one hundred and thirty-one thousand one hundred and forty; nine hundred and sixty-seven millions four thousand two hundred and ninety-six; sixty-one trillions, three hundred billions four hundred millions seven thousand six hundred and twenty-three.

3. One trillion one billion one million one thousand and one; six hundred and seventy billions and sixty-nine; eighty-one trillions eight billions one hundred millions eight hundred and ten thousand and eighty-one.

4. Ninety-one billions two hundred and thirty-four millions thirteen thousand four hundred and two; ninety-one billions two hundred and thirty-four millions two hundred and sixty-seven thousand one hundred and nine; one hundred trillions two hundred millions three thousand and four.

5. Sixty-seven trillions one hundred and eighty-nine billions four hundred and fifty-six millions seven hundred and thirteen thousand four hundred and twenty-seven; nine quintillions one hundred quadrillions nine trillions one hundred and thiry-four billions six hundred and seventy-one thousand and one.

6. Seven hundred and thirteen sextillions four hundred and fifty-six quintillions seven hundred and nineteen quadrillions one hundred and thirty-four trillions six hundred and thirteen billions forty-one thousand two hundred and thirty-four.

7. One hundred quadrillions one trillion and one million; two hundred and three trillions forty billions five hundred and six millions seventy thousand eight hundred and nine.

8. Nine hundred and eight trillions seven billions six hundred thousand and five; four trillions three billions two hundred thousand and one.

9. Two billions forty-six millions eight thousand and ten; eleven trillions one hundred and eleven billions one hundred and eleven millions one hundred and eleven thousand one hundred and eleven.

10. Forty thousand and seven; nine billions and nine; eight hundred and seventy billions eight millions seven hundred thousand and eighty-seven.

EXERCISE 3.

1. 3029, 5017, 6500, 8008, 9207, 4010, 7061, 8700.
2. 87411, 94006, 30415, 24024, 70000, 30001.
3. 567000, 204063.
4. 762709.
5. 604090.
6. 17000081, 40002006.
7. 140602007, 20000011.
8. 807020110, 700020000.
9. 5005005005, 20000000001.
10. 60000060000060.
11. 17000007000070.
12. 8070400276.

EXERCISE 4.

1. 9, 18, 33, 44, 99, 478, 330, 47, 74.
2. 777, 296, 843, 910, 1001, 1400.
3. 102, 511, 1539, 3030, 2858, 301.
4. 333, 10000, 90000, 6000, 5977, 27027, 40444.
5. 1899, 2222, 4505, 9604, 8888.
6. CCII, XLVII, XCI, LXXX, XX, LXXVII, CI, X, CXI, DCVI.

7. CDXXXVII, CMVIII, DCCCXCIX, DCCLXIII, CDXCVII, DCCCXXIX, DCCCXXVII, CMXCIX, DCCCLXXXVIII.

8. MMCCCXXXIII, MMMCCCXXXII, MMMCCCXXXIII, $\overline{\text{M}}\overline{\text{V}}$CCCXXI, MCCXXXIV, $\overline{\text{V}}$DCLXXVIII, $\overline{\text{V}}$MMMDCCLXV.

9. $\overline{\text{M}}\overline{\text{X}}$CMXCIX, $\overline{\text{X}}\overline{\text{X}}\overline{\text{V}}$DCLXXI, $\overline{\text{DCCCX}}$CMCCCXLVII, $\overline{\text{CMX}}$MMCCCXLII, $\overline{\text{X}}\overline{\text{V}}$MDCCXIII.

10. $\overline{\text{CX}}\overline{\text{C}}$MCMXIX, $\overline{\text{X}}\overline{\text{X}}\overline{\text{M}}\overline{\text{X}}$CXXXIV, $\overline{\text{X}}\overline{\text{X}}$MMMCDLXXVI, $\overline{\text{CMX}}$MMCCCXLV, $\overline{\text{MDCLXXV}}$MMMCMXLII, $\overline{\text{MMMCDLV}}$MDCCXIII.

Exercise 5.

(7)

713
80
3

796

(8)

12100
2210
1001
421
10002

25734

(9)

1020
304
1111
3212

5647

(10)

222
1111
3333
1212
90000

95878

(11)

60004
8000
741
21000

89745

(12)

23
416
3060

3499

EXERCISE 6.

(17)	(18)	(19)	(20)
1247	13147	6	12
91679	9	27	21
27	61946	93	679
1987	27	47	976
1800	1416	679	769
1796	934	496	9198
	1346	9999	4617
98536	16137		9860
	100	11347	
	76649		26132
	8		
	967		
	172686		

(21)	(22)	(23)	(24)
460	27016	67009	207609
7019	8007	49686	11000016
4850	60425	525016	5400720
9026	84611	3011	66229087
7999	19019	85727	987000617
1400	55700	16007	5735
6021	90704		
5087		746456	8069843784
4567	345482		
46429			

(25)	(26)	(27)	(28)
47	63	$13526156	2248016
89	58	6420224	3645320
217	79	4566376	4547224
104	57	3545508	4275896
120	63	849392	5496718
287		524264	
	320		20213174
864		$29431920	

(29)
749
1117
890
1279
4035

(30)
1497
1509
1164
1447
1523
1498
8638

(31)
1793
84
1877

Exercise 7.

(9)
807965778
603861725
204104053

(10)
5704980
5304640
400340

Exercise 8.

(13)
70460
9086
61374

(14)
800000
98647
701353

(15)
407080
998
406082

(16)
76000008
11978529
64021479

(17)
4070090
680704
3389386

(18)
27043006
20700080
6342926

(19)
960
576
384

(20)
47090
28796
18294

(21)
4260000
3000000
1260000

(22)
17+61+63+24=165
276
165
111

(23)

$12 + $17 + $29 + $164 + $716 + $690 = $1628

From $2700
Take $1628

$1072 = Remainder.

(24)

To $714
Add $417

Sum = $1131

From $1793
Take $1131

Remainder = $662 = share of 3rd.

(25)

$17896
$14070

$3826

(26)

769
861

1630 = sum.

From 1630
Take 708

922 = rem.

(27)

27000017
6179

26993838

(28)

50000
80000
25000
45000
10000
10000
15000

235000

From 600000
Take 235000

365000 = remainder.

(29)

Take any *four* numbers each greater than 100 which together do not amount to 743; subtract their sum from 743 and the remainder will be the 5th number.

Thus, let 107, 111, 123, and 146 be four of the numbers. Then 107 + 111 + 123 + 146 = 487.

From 743
Take 487

Rem. = 256 = 5th number.

(30)

Let 204, 718, and 500 be three of the addends.

Then 204 + 718 + 500 = 1422.

From 6149
Take 1422

4727 = 4th addend.

(31)

74967
6943

68024

(32)

64009
7143

71152

The minuend is equal to the sum of the subtrahend and the remainder, so we add.

(33)

1727
917

2644

We add for the same reason as in question 32.

(34)

2007
1963
2614

6584 = w'ght of the 3 loads.

From 9169
Take 6584

2585 = w'ght of 4th load.

(35)

Let 1076 be one number.

From 9137

Take 1076

Rem. = 8061 = the 2nd number.

EXERCISE 9.

(20)

$400007096 \times 11 = 4400078056$.

EXERCISE 10.

(1)

719867

4

2879468

12

34553616

(2)

916704

7

6416928

12

77003136

(3)

714367

3

2143101

9

19287903

(4)

161714

4

646856

4

2587424

(5)

71698

9

645282

9

5807538

(6)

81897

11

900867

11

9909537

(7)

716914

12

8602968

12

103235616

(8)

167149

6

1002894

9

9026046

(9)
191878
6
1151268
7
8058876

(10)
891476
8
7131808
8
57054464

(11)
918978
9
8270802
12
99249624

(12)
765439
11
8419829
12
101037948

(13)
604579 × 72
8
4836632
9
43529688

(14)
8968476 × 49
7
62779332
7
439455324

(15)
$147
7
$1029
7
$7203

(16)
$48
7
$336
9
$3024

(17)
987*
8
7896
10
78960

(18)
412 × 42
6
2472
7
17304 × 56
7
121128
8
969024

(19)
313 × 121
11
3443
11
37873

* 987 at $80 each come to the same as 80 at $987 each.

Exercise 11.

(1)

7191486
23

21574458
14382972

165404178

(2)

814976
89

7334784
6519808

72532864

(3)

819715
698

6557720
7377435
4918290

572161070

(4)

7819164
908

62553312
703724760

7099800912

(5)

6540910
8040

261636400
523272800

525388916400

(6)

7100867
8046

43145202
28763468
575269360

57857715882

(7)

8491791
91008

67934328
849179100
76426119

772820915328

(8)

28700046
90870

2009003220
229600368
2583004140

260797318002O

(9)

71400600
900708

571204800
4998042000
64260540000

64311091624800

(10)

123456789
98067

864197523
740740734
9876543120
1111111101

12107036926863

(11)

91845067
900004

367380268
8266056030000

82660927680268

(12)

9870643987
9060409

88835795883
394825759480
592238639220
88835795883

894320716156106833

(13)

71476
9187

500332
571808
71476
643284

656650012

(14)

91476
8190

8232840
91476
731808

749188440

(15)

8100070
81009

72900630
810007000
64800560

656178570630

(16)

5858857
506007

41011999
3515314200
292942850

2964622653999

(17)

6307918
20790

567712620
44155426
126158360

131141615220

(18)

78486
20

1569720
7019

14127480
1569720
109880400

11017864680

(19)

907
740

36280
6349

671180

671180
2821

671180
1342360
5369440
1342360

1893398780

217
13

651
217

2821

(20)

149
29

1341
298

4321

(21)

$106
217

742
106
212

$23002

(22)

1149
83

3447
9192

$95367

(23)

360
320

7200
1080

115200

(24)

97 × 17
17

679
97

1649 × 304
304

6596
49470

501296

(25)

183
53

549
915

9699
307

67893
290970

2977593

(26)

23
47

161
92

1081

Exercise 12.

(25)

12)200729711

16727475 11/12

(26)

7)882

126

(27)

11)746

67 9/11

(28)

12)1932

161

Exercise 13.

(1)

4)714967

4)178741—3 } 1×4=4
44685—1 } 4+3=7
44685 7/16

(2)

6)100901

9)33633—2 } 0×3=0
3737—0 } 0+2=2 } = 2/7
373 7 2/7

(3)

9)9186713

9)1020745—8 $\left.\begin{matrix} 1 \times 9 = 9 \\ 9 + 8 = 17 \end{matrix}\right\} = \frac{17}{81}$

113416—1

$113416\frac{17}{81}$

(4)

12)16151712

12)1345976—0 $\left.\begin{matrix} 8 \times 12 = 96 \\ 96 + 0 = 96 \end{matrix}\right\} = \frac{96}{144}$

112164—8

$112164\frac{96}{144}$

(5)

6)1671932

7)278655—2 $\left.\begin{matrix} 6 \times 6 = 36 \\ 36 + 2 = 38 \end{matrix}\right\} = \frac{38}{42}$

39807—6

$39807\frac{38}{42}$

(6)

9)22222222

12)2469135—7 $\left.\begin{matrix} 3 \times 9 = 27 \\ 27 + 7 = 34 \end{matrix}\right\} = \frac{34}{108}$

205761—3

$205761\frac{34}{108}$

(7)

11)617149324

11)56104484—0 $\left.\begin{matrix} 7 \times 11 = 77 \\ 77 + 0 = 77 \end{matrix}\right\} = \frac{77}{121}$

5100407—7

$5100407\frac{77}{121}$

(8)

10)8182838485

10)818283848—5 | 8 × 10 = 80

81828384—8 | 80 + 5 = 85

$81828384\frac{85}{100}$

(9)

8)667788991

8)83473623—7 | 7 × 8 = 56

10434202—7 | 56 + 7 = 63

$10434202\frac{63}{72}$

(10)

6)78998778998

9)13166463166—2 | 7 × 6 = 42

1463940351—7 | 42 + 2 = 44

$146294035\frac{44}{54}$

(11)

10)917048006 ÷ 110

11)91704800—6 | 0 × 10 = 0

8336800—0 | 0 + 6 = 6

$8336800\frac{6}{110}$

(12)

7)7C004019 ÷ 63

9)10000574—1 | 8 × 7 = 56

1111174—8 | 56 + 1 = 57

$1111174\frac{57}{63}$

(13)

411609 × 79 = 32517111

7)32517111 ÷ 56

8)4645301—4 } 5 × 7 = 35 } = $\frac{39}{56}$

580662—5 } 35 + 4 = 39 }

580662$\frac{39}{56}$

(14)

10)71496 ÷ 60

6)7149—6 } 3 × 10 = 30 } = $\frac{36}{60}$

1191—3 } 30 + 6 = 36 }

1191$\frac{36}{60}$.

(15)

7)918674 ÷ 56

8)131239—1 } 7 × 7 = 49 } = $\frac{50}{56}$

16404—7 } 49 + 1 = 50 }

16404$\frac{50}{56}$.

(16)

6)391717 ÷ 48

8)48619—3 } 3 × 6 = 18 } = $\frac{21}{48}$

6077—3 } 18 + 3 = 21 }

6077$\frac{21}{48}$.

(17)

6)1774 ÷ 48

8)295—4 } 7 × 6 = 42 } = $\frac{46}{48}$

36—7 } 42 + 4 = 46 }

$36$$\frac{46}{48}$.

(18)

3)1260 ÷ 21

7)420

60

(19)

71496 × 7 × 17 = 8508024

6)8508024 ÷ 66

11)1418004—0 } 5 × 6 = 30 } = $\frac{30}{66}$

128909—5 } 30 + 0 = 30 }

$12890\frac{30}{66}$.

(20)

5)71498 ÷ 45

9)14299—3 } 7 × 5 = 35 } = $\frac{38}{45}$

1588—7 } 35 + 3 = 38 }

$\$1588\frac{38}{45}$.

Exercise 14.

(1)

227)8916749($39280\frac{189}{227}$

681

2106

2043

637

454

1834

1816

189

(2)

1116)8161413($7313\frac{105}{1116}$

7812

3494

3348

1461

1116

3453

3348

105

(3)

2106)1498706(711$\frac{1340}{2106}$
14742
2450
2106
3446
2106
1340

(4)

8161)8222800(1007$\frac{4673}{8161}$
8161
61800
57127
4673

(5)

23)7142347(310536$\frac{19}{23}$
69
24
23
123
115
84
69
157
138
19

(6)

17)6171112(363006$\frac{10}{17}$
51
107
102
51
51
112
102
10

(7)

28161)8891876(315$\frac{21161}{28161}$
84483
44357
28161
161966
140805
21161

(8)

3344)11223344(3356$\frac{880}{3344}$
10032
11913
10032
18814
16720
20944
20064
880

(9)

```
81007)91929394(1134 67456/81007
      81007
      ------
      109223
       81007
      ------
       282169
       243021
      -------
       391484
       324028
      -------
        67456
```

(10)

```
19123)19167123(1002 5877/19123
      19123
      ------
        44123
        38246
        -----
         5877
```

(11)

$7 \times 17 \times 93 = 11067$

```
11067)9167492(828 4016/11067
      88536
      -----
      31389
      22134
      -----
      92552
      88536
      -----
       4016
```

(12)

$13 \times 15 \times 11 = 2145$

```
2145)6149811(2867 96/2145
     4290
     -----
     18598
     17160
     -----
      14381
      12870
      -----
      15111
      15015
      -----
         96
```

(13)

$617 \times 23 = 14191.$

```
14191)8182700(576 8684/14191
      70955
      ------
      108720
       99337
      ------
       93830
       85146
      ------
        8684
```

(14)

27498765)2526426017908695(91874163
247488885

51537167
27498765

240384029
219990120

203939090
192491355

114477358
109995060

44822986
27498765

173242219
164992590

82496295
82496295

(15)

50406)405768300(8050
403248

252030
252030

(16)

538362)4984155396(9258
4845258

1388973
1076724

3122499
2691818

4306896
4306896

(17)

$723 \times 417 = 301491$

$917)301491(328\frac{115}{917}$

2751

2639

1834

8051

7336

715

(18)

$1476 \times 238 = 351288$

$91)351288(3860\frac{28}{91}$

273

782

728

548

546

28

(19)

$271 \times 777 = 210567$

$1027)210567(205\frac{32}{1027}$

2054

5167

5135

32

(20)

$1271 \times 2986 = 3795206$

$407 \times 11 = 4477$

$4477)3795206(847\frac{3187}{4477}$

35816

21360

17908

34526

31339

3187

(21)

$217)9142(42\frac{28}{217}$

868

462

434

28

(22)

$798 = 35960$ shillings.

$)35960(3361\frac{2}{3}$

344

156

129

270

258

12

(23)

4017)27004009(6721
24102
29020
28119
9010
8034
9769
8034
1735

(24)

40690)8070000006(19832
40690
400100
366210
338900
325520
133800
122070
117300
81380
359206
325520
33686

(25)

79410)704000001(8865
635280
687200
635280
519200
476460
427401
397050
30351

(26)

29)677(23
58
97
87
10

Exercise 15.

(1)

719×400 = 287600
16× 20 = 320
19×5÷12 = $7\frac{11}{12}$
$2879·27\frac{11}{12}$

(2)

671×400 = 268400
12× 20 = 240
32×5÷12 = $13\frac{4}{12}$
$2686·53\frac{4}{12}$

(3)

167×400=66800
41×5÷12= $17\frac{1}{12}$
$668·17\frac{1}{12}$

(4)

17×400=6800
17× 20= 340
30×5÷12= $12\frac{1}{2}$
$71·52\frac{1}{2}$

(5)

655×400=262000
19× 20= 380
35×5÷12= $14\frac{7}{12}$
$2623·94\frac{7}{12}$

(6)

777×400=310800
11× 20= 220
12×5÷12= 5
$3110·25

(7)

111×400=44400
11× 20= 220
44×5÷12= $18\frac{1}{3}$
$446·38\frac{1}{3}$

(8)

367×400=226800
8× 20= 160
37×5÷12= $15\frac{5}{12}$
$2269·75\frac{5}{12}$

(9)

57×400=22800
8× 20= 160
22×5÷12= $9\frac{1}{6}$
$229·69\frac{1}{6}$

(10)

704×400=281600
19× 20= 380
47×5÷12= $19\frac{7}{12}$
$2819·99\frac{7}{12}$

EXERCISE 16.

(1)

$719·40
$719 ÷ 4 = £179 + $3
340 cents ÷ 20 = 17s.
£179 17s.

$69·70
$69 ÷ 4 = £17 + $1
170 cts. ÷ 20 = 8s. + 10 cts.
10 cents × 3 ÷ 5 = 6d.
£17 8s. 6d.

$171·11
$171 ÷ 4 = £42 + $3.
311 cts. ÷ 20 = 15s. + 11c.
11 cts. × 3 ÷ 5 = $6\frac{3}{5}$d.
£42 15s $6\frac{3}{5}$d.

$1674·23
$1674 ÷ 4 = £418 + $2.
223 c. ÷ 20 = 11s. + 3 c.
3 × 3 ÷ 5 = $1\frac{4}{5}$d.
£418 11s. $1\frac{4}{5}$d.

$444·44
$444 ÷ 4 = £111
44 ÷ 20 = 2s. + 4c.
4 × 3 ÷ 5 = $2\frac{2}{5}$d.
£111 2s. $2\frac{2}{5}$d.

$70·07
$70 ÷ 4 = £17 + $2
207c ÷ 20 = 10s. + 7c.
7c × 3 ÷ 5 = $4\frac{1}{5}$d.
£17 10s. $4\frac{1}{5}$d.

$917·10
$917 ÷ 4 = £229 + $1
110 cts. ÷ 20 = 5s. + 10 cts.
10 cents × 3 ÷ 5 = 6d.
£229 5s. 6d.

$417·95
$417 ÷ 4 = £104 + $1
195 cts. ÷ 20 = 9s. + 15 cts.
15c × 3 ÷ 5 = 9d.
£104 9s. 9d.

(2)

$190·09
$190 ÷ 4 = £47 + $2.
209 cts. ÷ 20 = 10s. + 9 cts.
9c. × 3 ÷ 5 = $5\frac{2}{5}$d.
£47 10s. $5\frac{2}{5}$d.

$777·77
$777 ÷ 4 = £194 + $1
177 cents ÷ 20 = 8s. + 17c.
17 × 3 ÷ 5 = $10\frac{1}{5}$d.
£194 8s. $10\frac{1}{5}$d.

(3)

$111·26
$111 ÷ 4 = £27 + $3
326 cents ÷ 20 = 16s. + 6c.
6c × 3 ÷ 5 = $3\frac{3}{5}$d.
£27 16s. $3\frac{3}{5}$d.

$191·82
$191 ÷ 4 = £47 + $3
382c. ÷ 20 = 19s. + 2c.
2c × 3 ÷ 5 = $1\frac{1}{5}$d.
£47 19s. $1\frac{1}{5}$d.

(4)

$714·23
$714 ÷ 4 = £178 + $2
223c ÷ 20 = 11s. + 3c
3c × 3 ÷ 5 = 1⅕d.
£178 11s. 1⅕d.

$16·16
$16 ÷ 4 = £4
16c ÷ 20 = 0s. + 16c
16c × 3 ÷ 5 = 9⅗d.
£4 0s. 9⅗d.

$21·17
$21 ÷ 4 = £5 + $1
117c ÷ 20 = 5s. + 17c.
17 × 3 ÷ 5 = 10⅕d.
$5 5s. 10⅕d.

£7934·98
$7934 ÷ 4 = £1983 + $2
298c ÷ 20 = 14s. + 18c
18c × 3 ÷ 5 = 10⅘d.
£1983 14s. 10⅘d.

Exercise 17.

(1)

$749·86
614·91
9167·14
918·40
21·74
614·29
29·78
$12116·12

(2)

$888·77
916·66
1147·98
91867·42
1919·19
981·92
444·59
$98166·53

(3)

£9 8s. 7½d. = $37·72½
$617·49
74·27
23·32
37·72½
$752·80½

(4)

$6714·98
982·49
$5732·49

(5)

$4216·23
2437·86
$1778·37

(6)

£471 16s. 10½d. = $1887·37½
$1887·37½
914·71
$972·66½

(7)

£29 18s. 9d. = $119·75
$649·32
119·75
$529·57

(8)

$671·21 × 48

4

$2684·84

12

$32218·08

(9)

$519·26

789

467334

415408

363482

$409696·14

(10)

$16·83

529

15147

3366

8415

$8903·07

(11)

$6149·73 ÷ 67

= 614973 cents ÷ 67.

67)$6149·73($91·78 47/67

603

119

67

527

469

583

536

47

(12)

149)$18793·67($126·13 39/149.

149

389

298

913

894

196

149

477

447

30

(13)

$1714·86 ÷ $71.42 = 171486 cents ÷ 7142 cents.

7142)171486(24 711/7142

14284

28646

28568

78

(14)

$9167·42 ÷ $147·83 = 916742 cents ÷ 14783 cents.

14783)916742(62$\frac{196}{14783}$

88698

29762

29566

196

(15)

$147·80
217·20
63·27
23·87

$452·14

(16)

3)$916·74 ÷ 27

9)305·58 — 0 } 3 × 3 = 9 } = $\frac{9}{27}$

$33·95 — 3 } 9 + 0 = 9 }

$33·95$\frac{9}{27}$.

(17)

$671·90 ÷ 13 =
67190 cents ÷ 13
13)67190 (5168$\frac{6}{13}$ cts. =
65 $51·68$\frac{6}{13}$

21
13

89
78

110
104

6

(18)

£71 16s. 7½d = $287·32½

$17·80
21·63
123·76
37·26

Sum = $200·45
From 287·32½
Take 200·45

$86·87½ = Remainder

(19)

$17·45 × 17

17

12215

1745

$296·65

(20)

$723·86

297·42

$426·44 × 63

9

3837·96

7

217) $26865·72 ($123·80 113/217

217

516

434

825

651

1747

1736

112

(21)

$314823

718296

9447727

2462765

7904400

325376

112538

1443044

$22728969

(22)

$29078527

22728969

$6349558

(23)

2954600) $29078527 ($9·84 $\frac{526300}{2954600}$
26591400

24871270
23636800

12344700
11811400

526300

EXERCISE 18.

(1)

47 × 128 = 6016

(2)

6497 × 16 = 103952

(3)

£97 16s. 8½d.
20
1956
12
23480
4
93982

(4)

acres.	roods.	per.	yds.	ft.	in.
137	2	17	19	8	121

137
4
510
40
20417
30¼
612529
5104¼
617633¼ yds.

	yds.	ft.	in.
617633¼ yds. =	617633	2	36
Add		8	121
	617634	2	13

617634
9
5558708
144
22234845
22234832
5558708
800453965

(5)

tons	cwt.	grs.	lbs.	oz.	drs.
569	4	3	17	4	7
20					
11384					
4					
45539					
25					
227712					
91078					
1138492					
16					
6830956					
1138492					
18215876					
16					
109295263					
18215876					
291454023					

(6)

Pipes	hhds.	brl.	gal.	qts.
4	1	1	19	2
2				
9				
2				
19				
31½				
38				
57				
9½				
617½				
4				
2472 qts.				

(7)

Miles.	far.	per.	yds.	ft.	in.
17	7	7	2	2	4
8					
143					
40					
5727					
5½					
28637					
2863½					
31500½					
3					
94503½					
12					
1134046					
12					
13608552 lines.					

(8)

5°	17′	49″
60		
317		
60		
19069 sec.		

(9)

Ch.	bush.	pks.	gal.	qt.
2	17	2	1	1
36				
89				
4				
358				
2				
717				
4				
2869				
2				
5738 pts.				

(10)

Fr. ells.	qr.	na.	in.
9	1	3	1¼
6			
55			
4			
223			
2¼			
447¼			
55¼			
503 in.			

(11)

Weeks.	days.	hrs.	m.	sec.
17	4	9	29	17
7				
123				
24				
501				
246				
2961				
60				
177689				
60				
10661357				

(12)

E.	$	d.	c.	m.
29	9	6	2	4
299624				

(13)

lbs.	oz.	dwt.	grs.
7	9	16	11
12			
213			
20			
4276			
24			
17115			
8552			
102635 grs.			

(14)

Cub. yds.	cub. ft.	cub. in.
37	9	1111
27		
268		
74		
1008		
1728		
9175		
2016		
7056		
1008		

1742935 cub. in.

(15)

lb.	oz.	scr.	grs.
129	4	2	11
12			
1552			
8			
12416			
3			
37250			
20			

745011 grs.

(16)

Per.
127
30¼
3810
31¼
3841¼
9

$34575\frac{1}{4}$ = 34575 ft. 108 in.

(17)

E. ell.	qr.	na.
127	1	2
5		
636		
4		
2546		
2¼		
5092		
636¼		

5728¼ in.

(18)

C.	cub. ft.
17	63
128	
199	
34	
17	
2239 cub. ft.	

(19)

gal.

714 × 4 = 2856 qts.

(20)

lbs.	oz.	drs.
71	11	3
12		
863		
8		
6907		
3		
20721		

(21)

cwt.	qr.	lbs.
16	1	19
4		
65		
25		
344		
130		
1644		
16		
9864		
1644		
26304 oz.		

(22)

mls.	ft.
11	2
8	
88	
40	
3520	
5½	
17600	
1760	
19360	
3	
58082	
12	
696984 in.	

(23)

acres.	per.
123	17
4	
492	
40	
19697	
30¼	
590910	
4924¼	
595834¼ sq.yds.	

(24)

yrs. days. min.

27 16 4

365¼

151
162
81
6¼

9877¾
24

39508
19754
18

237066
60

14223964
60

853437840 sec.

(25)

days. hrs.

161 14
24

658
322

3878 hrs.

(26)

£1978 17s. 9½d.
20

39577
12

474933
4

1899734 far.

(27)

bush. pk. gal.

17 1 1
4

69
2

139
4

556
2

1112 pts.

(28)

lbs. dwt.

9 17
12

108
20

2177
24

8708
4354

52248

(29)

sq. m.	a.	yds.
9	1	9
640		
5761		
4		
23044		
40		
921760		
30¼		
27652809		
230440		
27883249		
9		
250949241		
144		
1003796964		
1003796964		
250949241		
36136690704 sq. in.		

(30)

£171 11s. 1½d.

20

3431

12

41173

4

164695 far.

Exercise 19.

(1)

12)71989

3)5999 ft. 1 in.

5½ | 1999 yds. 2 ft. 1 in.
2 | 2

11)3998

40)363 per. 2½ yds. 2 ft. 1 in.

4)9 fur. 3 per. 3 yds. 0 ft. 7 in.

2 m. 1 fur. 3 per. 3 yds. 0 ft. 7 in.

(2)

60)6142 min.

24)102 hrs. 22 min.

4 d. 6 h. 22 m.

(3)

20)81427 grs.

3)4071 scr. 7 grs.

8)1357 drs. 0 scr. 7 grs.

12)169 oz. 5 drs. 7 grs.

14 lbs. 1 oz. 5 drs. 7 grs.

(4)

1728)9141762 cub. in.

16)5290 cub. ft. 642 cub. in.

8)330 cord ft. 10. cub. ft. 642 cub. in.

41 c. 2 c. ft. 10 cub. ft. 642 cub. in.

(5)

2)71777 pts.

4)35888 qts. 1 pt.

2)8972 gls. 1 pt.

4)4486 pk. 1 pt.

36)1121 bush. 2 pk. 1 pt.

31 ch. 5 bush. 2 pk. 1 pt.

(6)

27)914 cub. ft.

33 cub. yds. 23 cub. ft.

(7)

2¼ 61479 inches.
4 4

9)245916

4)27324 ns.

6)6831 qrs.

1138 French ells 3 qrs.

(8)

7)89 days.

12 weeks 5 days.

(9)

16)1714964 drams.

16)107185 oz. 4 drs.

25)6699 lbs. 1 oz. 4 drs.

4)267 qrs. 24 lbs. 1 oz. 4 drs.

20)66 cwt. 3 qrs. 24 lbs. 1 oz. 4 drs.

3 tons 6 cwt. 3 qrs. 24 lbs. 1 oz. 4 drs.

(10)

144)1714961 inches.

9)11909 ft. 65 in.

30¼ 1323 yds. 2 ft. 65 in.

4 4

121) 5292

43 sq. per. 89 qr. yds. 2 ft. 65 in. =

40)43 sq. per. 22 yds. 4 ft. 101 in.

1 rood 3 per. 12 yds. 4 ft. 101 in.

(11)

4)171439 qts.

31½ 42859 gal. 3 qts.

2 2

63) 85718

2)1360 bar. 38 half-gal. 3 qts.

2)680 hhds. 19 gal. 3 qts.

2)340 pi. 19 gal. 3 qts.

170 tuns 19gal. 3 qts.

(12)

60)171491642 sec.

60) 2858194 min. 2 sec.

24)47636 hrs. 34 min. 2 sec.

365¼ 1984 dys. 20 hrs. 34 m. 2 sec.

4 4

1461) 7936

5 yrs. 631 qr. dys. 20 hrs. 34 m. 2 sec.

= 5 yrs. 157¾ dys. 20 hrs. 34 m. 2 sec.

= 5 yrs. 158 dys. 14 hrs. 34 m. 2 sec.

(13)

4)171496894 far.

12)42874223½d.

20)3572851 shil. 11½d.

£178642 11s. 11½d.

(14)

10)2987149 mills.

10)298714 c. 9 mills.

10)29871 d. 4 c. 9 mills.

10)2987$ 1d. 4 c. 9 mills.

298E. 7$ 1d. 4c. 9 mills.

(15)

144)21111496 inches.

9)146607 ft. 88 in.

30¼ 16289 yds. 6 ft. 88 in.

4 4

121) 65156

538 per. 58 qr. yds. 6 ft. 88 in.

538 per. 14½ yds. 6 ft. 88 in.

40)538 per. 15 yds. 2 ft. 16 in.

4)13 roods 18 per. 15 yds. 2 ft. 16 in.

3 a. 1 r. 18 per. 15 yds. 2 ft. 16 in.

(16)

128)17498 cub. ft.

136 c. 90 cub. ft.

(17)

12)919817 pence

20)76651 shil. 5d.

£3832 11s. 5d.

(18)

20)999 dwt.

12)49 oz. 19 dwt.

4 lb. 1 oz. 19 dwt.

(19)

2)1771 gal.

4)885 pk. 1 gal.

221 bus. 1 pk. 1 gal.

(20)

2)91666 Fl. ells.

45833 Fr. ells.

(21)

25)17149 lbs.

4)685 qrs. 24 lbs.

20)171 cwt. 1 qr. 24 lbs.

8 tons 11 cwt. 1 qr. 24 lbs.

(22)

3)17110 ft.

5½) 5703 yds. 1 ft.
2 2

11 11406

40)1036 per. 5 yds. 1 ft.

8)25 fur. 36 per. 5 yds. 1 ft.

3 m. 1 fur. 36 per. 5 yds. 1 ft.

(23)

60)1111111 sec.

60)18518 min. 31 sec.

308 deg. 38 m. 31 sec.

(24)

1728)667789 cub. in.

27)386 cub. ft. 781 cub. in.

14 cub. yds. 8 cub. ft. 781 cub. in.

(25)

20)7891427 grs.

3)394571 scr. 7 grs.

8)131523 drs. 2 scr. 7 grs.

12)16440 oz. 3 drs. 2 scr. 7 grs.

1370 lbs. 0 oz. 3 drs. 2 scr. 7 grs.

(26)

24)678846 grs.

20)28285 dwt. 6 grs.

12)1414 oz. 5 dwt. 6 grs.

117 lbs. 10 oz. 5 dwt. 6 grs.

(27)

16)298714 drams.

16)18669 oz. 10 drs.

25)1166 lbs. 13 oz. 10 drs.

4)46 qrs. 16 lbs. 13 oz. 10 drs.

11 cwt. 2 qrs. 16 lbs. 13 oz. 10 drs.

(28)

144)61479867 inches.

9)426943 ft. 75 in.

30¼) 47438 yds. 1 ft. 75 in.

4 4

121 189752

40)1568 per. 6 yds. 1 ft. 75 in.

4)39 r. 8 per. 6 yds. 1 ft. 75 in.

9 a. 3 r. 8 per. 6 yds. 1 ft. 75 in.

(29)

5½ 91999 yds.
2 2

11)183998

40)16727 per. 1 half yd.

8)418 fur. 7 per. 1 ft. 6 in.

3)52 m. 2 fur. 7 per. 1 ft. 6 in.

17 lea. 1 m. 2 fur. 7 per. 1 ft. 6 in.

(30)

12)714986 in.

6)59582 ft. 2 in.

9930 fathoms 2 ft. 2 in.

Exercise 23.

(1)

£74 19 4¾ × 16
4

299 17 7
4

£1199 10 4

(2)

lbs. oz. dwt.
75 4 7 × 18
3

226 1 1
6

1356 6 6

(3)

Days hrs. min.
16 4 17 × 21
3

48 12 51
7

339 17 57

(4)

Fl. ells. qrs. na.
37 2 1 × 35
5

188 2 1
7

1321 0 3

(5)

m.	fur.	per.	
63	4	7	× 56
		8	
508	1	16	
		7	
3557	1	32	

(6)

gal.	qts.	pts.	
71	2	1	× 77
		7	
501	1	1	
		11	
5515	0	1	

(7)

hrs.	min.	sec.	
43	19	36	× 84
		7	
303	17	12	
		12	
3639	26	24	

(8)

a.	r.	per.	
16	3	17	× 108
		9	
151	2	33	
		12	
1820	1	36	

(9)

oz.	drs.	scr.	grs.	
91	6	2	19	× 121
			11	
1010	4	2	9	
			11	
11116	4	2	19	

(10)

£	s.	d.		
116	11	11½		× 42
			6	
699	11	7½		
			7	
4897	1	4½		

(11)

per.	yds.	ft.		
115	4	7		× 144
		12		
1381	26½	3		
		12		
16582	22½	0		

=16582 22 4 ft. 72 in.

(12)

cwt.	qrs.	lbs.		
93	3	17	× 99	
		9		
845	1	3		
		11		
9298	0	8		

(13)

yrs.	days.	hours.	
16	110	11	× 50
		10	
163	8½	14	
		5	
815	43½	22	
= 815	44	4	

(14)

c.yds.	c.ft.	c. in.	
29	17	1110	× 48
		4	
118	16	984	
		12	
1423	9	1440	

(15)

bus.	pk.	gal.	qt.	pt.	
126	0	0	1	1	× 54
				6	
756	1	0	1	0	
				9	
6806	3	0	1	0	

(16)

£	s.	d.	
£27	16	0¾	× 100
		10	
278	0	7½	
		10	
£2780	6	3	

(17)

per.	yds.	ft.	in.	
74	4	2	11	× 600
			6	
449	1½	2	6	
			10	
4494	1	1	0	
			10	
44942	2	1	0	

(18)

hrs.	min.	sec.	
93	17	57	× 1100
		10	
932	59	30	
		10	
9329	55	0	
		11	
102629	5	0	

(19)

a.	r.	per.	yds.	
5	2	7	9	× 560
			7	
38	3	11	2½	
			8	
310	2	8	20	
			10	
3105	2	6	18½	

(20)

£	s.	d.		
63	14	9½		× 8100
			10	
637	7	11		
			10	
6373	19	2		
			9	
57365	12	6		
			9	
£510290	12	6		

3105 a. 2r. 6 per. 18 yds. 4 ft. 72 in.

EXERCISE 24.

(1)

718 = 700 + 10 + 8

bush.	pk.	gal.	qt.		bush.	pk.	gal.	qts.
4	1	0	1	× 8 =	34	1	0	0
			10					
42	3	0	2	× 1 =	42	3	0	2
			10					
428	0	1	0	× 7 =	2996	3	1	0
					3073	3	1	2

(2)

867 = 800 + 60 + 7

£	s.	d.			£	s.	d.
16	14	11¼	× 7 =		117	4	6¾
167	9	4½	× 6 =		1004	16	3
1674	13	9	× 8 =		13397	10	0
					£14519	10	9¾

(3)

263 = 200 + 60 + 3

dys.	hrs.	min.			dys.	hrs.	min.
9	4	17	× 3 =		27	12	51
91	18	50	× 6 =		550	17	0
917	20	20	× 2 =		1835	16	40
					2413	22	31

(4)

83 = 80 + 3

yds.	ft.	in.			yds.	ft.	in.
47	2	7	× 3 =		143	1	9
478	1	10	× 8 =		3828	2	8
					3972	1	5

(5)

197 = 100 + 90 + 7

lbs.	oz.	dwt.		lbs.	oz.	dwt.
6	4	7	× 7 =	44	6	9
		10				
63	7	10	× 9 =	572	7	10
		10				
636	3	0	× 1 =	636	8	0
				1253	4	19

(6)

985 = 900 + 80 + 5

a.	r.	p.	yd.	ft.		a.	r.	p.	yd.	ft.
7	0	4	0	3	× 5 =	35	0	20	1	6
				10						
70	1	0	3	3	× 8 =	562	0	0	26	6
				10						
702	2	1	2½		3 × 9 =	6322	2	9	27½	0
						6919	2	30	25½	3 =

6919 a. 2 r. 30 per. 25 yds. 7 ft. 7 in.

(7)

1149 = 1000 + 100 + 40 + 9

yds.	qr.	na.		yds.	qr.	na.
16	3	1	× 9 =	151	1	1
		10				
168	0	2	× 4 =	672	2	0
		10				
1681	1	0	× 1 =	1681	1	0
		10				
16812	2	0	× 1 =	16812	2	0
				19317	2	1

(8)

6472 = 6000 + 400 + 70 + 2

oz.	drs.	scr.	grs.		oz.	drs.	scr.	grs.
23	7	2	16	× 2 =	47	7	2	12
			10					
239	7	1	0	× 7 =	1679	3	1	0
			10					
2399	1	1	0	× 4 =	9596	5	1	0
			10					
23991	5	1	0	× 6 =	143950	0	0	0
					155274	0	1	12

(9)

8298 = 8000 + 200 + 90 + 8

£	s.	d.			£	s.	d.
£9	11s.	4¼d.	× 8 =		£76	10s.	10d.
		10					
95	13	6½	× 9 =		861	1	10½
		10					
956	15	5	× 2 =		1913	10	10
		10					
9567	14	2	× 8 =		76541	13	4
					£79392	16	10½

(10)

67 = 60 + 7.

cwt.	qr.	lbs.			cwt.	qr.	lbs.
73	1	16	× 7 =		513	3	12
		10					
734	0	10	× 6 =		4404	2	10
					4918	1	22

(11)

647 = 600 + 40 + 7

m.	fur.	per.	yd.	ft.	in.		m.	fur.	per.	yd.	ft.	in.
7	4	16	2	2	6	× 7 =	52	6	35	2½	2	6
					10							
75	4	5	½	1	0	× 4 =	302	0	20	3	1	0
					10							
755	1	11	2½	1	0	× 6 =	4530	7	29	½	0	0
							4885	7	5	1½	0	6
						=	4885	7	5	1	2	0

(12)

217 = 200 + 10 + 7

E. ells.	qr.	na.	in.		E. ells.	qr.	na.	in.
17	4	2	1	× 7 =	125	2	1	0¼
			10					
179	1	0	1	× 1 =	179	1	0	1
			10					
1792	1	0	1	× 2 =	3584	2	0	2
					3889	0	2	1

(13)

982 = 900 + 80 + 2

cwt.	qrs.	lbs.	oz.	drs.		cwt.	qrs.	lbs.	oz.	drs.
6	1	17	4	7	× 2 =	12	3	9	8	14
				10						
64	0	22	12	6	× 8 =	513	3	7	3	0
				10						
642	1	2	11	12	× 9 =	5780	1	24	9	12
						6370	0	16	5	10

(14)

$2345 = 2000 + 300 + 40 + 5$

a.	r.	p.	yd.	ft.	in.			a.	r.	p.	yd.	ft.	in.
8	2	14	17	16	117	× 5 =		42	3	32	28	2	81
					10								
85	3	25	26	2	126	× 4 =		343	2	23	14	4	108
					10								
859	0	18	21	1	108	× 3 =		2577	1	16	3	0	108
					10								
8591	0	26	30	4	0	× 2 =		17182	1	13	30	5	108
								20146	1	6	16	0	45

(15)

$567 = 500 + 60 + 7$

yrs.	dys.	hrs.	min.	sec.			yrs.	dys.	hrs.	min.	sec.
11	217	23	47	18	× 7 =		81	64	22	31	6
				10							
115	352½	20	53	0	× 6 =		695	295½	5	18	0
				10							
1159	248½	16	50	0	× 5 =		5798	148½	12	10	0
							6575	143½	17	59	6
						=	6575	144	11	59	6

(16)

$103 = 100 + 3$

c.	c. ft.	cub. ft.			c.	c. ft.	cub. ft.
2	7	14	× 3 =		8	7	10
		10					
27	6	12	× 10 =		298	3	8
					307	3	2

(17)

3218 = 3000 + 200 + 10 + 8

bush.	pk.	gl.	qt.	pt.			bush.	pk.	gl.	qt.
7	1	1	1	1	× 8 =		59	1	1	0
				10						
74	0	1	3	0	× 1 =		74	0	1	3
				10						
742	0	1	2	0	× 2 =		1484	1	1	0
				10						
7421	3	1	0	0	× 3 =		22265	2	1	0
							23883	2	0	3

(18)

975 = 900 + 70 + 5

lbs.	oz.	dr.	scr.	grs.			lbs.	oz.	dr.	scr.	grs.
67	4	6	1	11	× 5 =		336	11	3	1	15
				10							
673	10	7	0	10	× 7 =		4717	4	2	0	10
				10							
6739	11	7	2	0	× 7 =		60651	8	5	0	0
							65706	0	2	2	5

(19)

780 = 700 + 80

£		s.	d.				£		s.	d.
174		16	0	½						
				10						
1748		0	2	½	× 8 =		£13984		1	8
				10						
17480		2	1	′	× 7 =		122360	14	7	
							£136344	16	3	

(20)

$359 = 300 + 50 + 9$

lbs.	oz.	dwt.	grs.		lbs.	oz.	dwt.	grs.
23	11	16	11	$\times 9 =$	215	10	8	3
			10					
239	10	4	14	$\times 5 =$	1199	3	2	22
			10					
2398	6	5	20	$\times 3 =$	7195	6	17	12
					8610	8	8	13

Exercise 25.

(11)

$24 = 2 \times 12$

2)£196 7s. 8d.

12) 98 3 10

£8 3 $7\frac{10}{24}$

(12)

$35 = 7 \times 5$

fur.	per.	yds.	ft.	in.		
7)149	17	4	0	0		
5)21	3	5	0	10	..2 rem.	$4 \times 7 = 28$
4	10	4	0	12	..4 rem.	$28 + 2 = 30$

$= 4$ fur. 10 per. 4 yds. 1 ft. $0\frac{10}{35}$ in.

(13)

$81 = 9 \times 9$

	hrs.	min.	sec.	
9)	1479	47	16	
9)	164	25	15	1 rem.
	18	16	8	3 rem.

$3 \times 9 = 27 + 1 = 28 =$ true rem.

18 hrs. 16 min. $8\frac{14}{81}$ sec.

(14)

$108 = 9 \times 12.$

	lbs.	oz.	dwt.		
9)	1890	7	12		
12)	210	0	16	21	3 rem.
	17	6	1	9	9 rem.

$9 \times 9 = 81 + 3 = 84 =$ true rem.

17 lbs. 6 oz. 1 dwt. $9\frac{84}{108}$ grs.

(15)

$132 = 11 \times 12$

	sq. per.	yds.	ft.	in.	
11)	679	0	7	107	
12)	61	22	0	101	4 rem.
	5	4	3	35	5 rem.

$5 \times 11 = 55 + 4 = 59$ true rem.

5 sq. per. 4 yds. 3 ft. 35 $\frac{48}{132}$ in.

(16)

72 = 6 × 12

qrs.	lbs.	oz.	drs.	
6)3	19	11	7	
12)15	12	9	1	rem.
1	5	0	9	rem.

9 × 6 = 54 + 1 = 55.

1 lb. 5 oz. $0\frac{55}{72}$ dr.

(17)

144 = 12 × 12

yrs.	days.	hrs.	min.	sec.
12)1167	119	11	0	0
12)97	101	4	55	0
8	38	20	24	35

(18)

oz.	drs.	scrs.	grs.	oz.	drs.	scrs.	grs.
97)987	7	1	16	(10	1	1	$8\frac{89}{97}$
97							
17							
8							
143							
97							
46							42 scr.
3							20
139							856
97							776
42 scr.							80

(19)

roods. per. ft. in. roods. per. yd. ft. in.

117)1679 4 7 96 (14 14 1 5 3$\frac{96}{117}$

117

509

468

41

40

1644

117

474

468

6

20$\frac{1}{2}$

181$\frac{1}{2}$

117

64$\frac{1}{2}$

9

587$\frac{1}{2}$

585

2$\frac{1}{2}$

144

456

351

105

(20)

```
      wks. dys. hrs.m. sec.  wks.dys. hr. m.  sec.
916)7967  4    0   0  17   (8   4   21  18  4673/916.
    7328
    ----
     639
       7
    ----
    4477
    3664
    ----
     313
      24
   -----
   19512
   1832
   -----
    1192
     916
    ----
     276
      60
   -----
   16560
     916
    ----
    7400
    7328
    ----
      72
      60
    ----
    4337
    3664
    ----
     673
```

(21)

117)£96749 16s $11\frac{1}{4}$d (£826 18s 5d $\frac{105}{117}$far.

936

314

234

809

702

107

20

2156

117

986

936

50

12

611

585

26

4

105

(22)

c. c. ft. cub. ft. c. c. ft. cub. ft.

89)479 7 11 (5 3 $2\frac{25}{89}$

445

34

8

279

267

12

16

203

178

25

(23)

147)7171° 17′ 19″ (48° 47′ $3\frac{88}{147}$′

588

1291
1176

115
60

6917
588

1037
1029

8
60

499
441

58

(24)

Fr.ells.	qr.	na.	in.	Fr.ells.	qrs.	na.	in.
267	1	2	1	5	2	3	$2\frac{1}{1068}$

1467
1335

132
6

793
534

259
4

1038
801

237
$2\frac{1}{4}$

475
$59\frac{1}{4}$

$534\frac{1}{4}$
534

$\frac{1}{4}$

$\frac{1}{4} \div 267 = 1 \div 1068 = \frac{1}{1068}$.

(25)

miles.	fur.	per.	yds.		miles.	fur.	per.	yds.	ft.	in.
67)916	6	0	4	(	13	5	18	2	2	$6\frac{42}{67}$
67										
246										
201										
45										
8										
366										
335										
31										
40										
1240										
67										
570										
536										
34										
$5\frac{1}{2}$										
191										
134										
57										
3										
171										
134										
37 ft.										

37 ft.
12
444
402
42

(26)

161)£1911 17s. 0d. (£11 17s 5d. 140far.
161

301
161

140
20

2817
161

1207
1127

80
12

960
805

155
4

623
483

140

(27)

	lbs.	oz.	dwt.		lbs.	oz.	dwt.	grs.
963)9134	4	17	(	9	5	16	11	963
8667								
467								
12								
5608								
4815								
793								
20								
15877								
963								
6247								
5778								
469								
24								
11256								
963								
1626								
963								
663								

(28)

bush.	pk.	gal.	qt.	pt.
417)7149	0	0	1	1
417				
2979				
2919				
60				
4				
240				
2				
480				
417				
63				
4				
253				
2				
507				
417				
90				

bush.	pk.	gal.	qt.	pt.
(17	0	1	10	$1\frac{10}{417}$

(29)

days.	hrs.	min.	sec.
603)2716	14	17	9
2412			
304			
24			
7310			
603			
1280			
1206			
74			
60			
4457			
4221			
236			
60			
14169			
1206			
2109			
1809			
300			

days.	hrs.	min.	sec.
(4	12	7	$23\frac{300}{603}$

(20).

	cwt.	lbs.	oz.		cwt.	qrs.	lbs.	oz.	drs.
347)4000	19	11	(	11	2	2	12	11$\frac{135}{347}$
347								
530								
347								
183								
4								
732								
694								
38								
25								
969								
694								
275								
16								
4411								
347								
941								
694								
247								
16								
3952								
347								
482								
347								
135								

EXERCISE 26.

(1)

739 days 4 hrs 16 min. = 63864960 sec.
23 hrs. 14 min. 42 sec. = 83682 sec.
63864960 ÷ 83682 = $763\frac{154}{83682}$.

(2)

£4967 0s. 0½d. = 4768321 far.
£63 17s. = 61296 far.
4768321 ÷ 61296 = $77\frac{48529}{61296}$.

(3)

£1192 17s. 8d. = 1145168 far.
£9 17s. 4¾d. = 9475 far.
1145168 ÷ 9475 = $120\frac{3168}{9475}$.

(4)

986 cwt. 2 qrs. 17 lbs. = 1578672 oz.
6 cwt. 1 qr. 17 lbs. 9 oz. = 10281 oz.
1578672 ÷ 10281 = $153\frac{5679}{10281}$.

(5)

426 a. 1 r. 23 per. = 74294847 quarter-feet.
2 a. 8 per. 17 yds. 4 ft. = 357820 quarter-feet.
74294847 ÷ 357820 = $207\frac{235107}{357820}$.

(6)

71 fur. 16 per. 3 yds. 1 ft. = 565608 inches.
27 per. 3 yds. 2 ft. 7 in. = 5485 inches.
565608 ÷ 5485 = $103\frac{653}{5485}$.

(7)

1122 cords 3 c. ft. = 143664 cub. ft.
12 cords 11 cub. ft. = 1547 cub. ft.
143664 ÷ 1547 = $92\frac{1349}{1547}$.

(8)

111 lbs. 4 oz. 7 dwt. = 641448 grains.
9 oz. 7 dwt. 17 grs. = 4505 grains.
$641448 \div 4505 = 142\frac{1738}{4505}$.

(9)

1468 Eng. ells 2 qrs. 1 na. = 264321 quarter-inches.
73 Fl. ells 1 na. 1 in. = 7897 quarter-inches.
$264321 \div 7897 = 33\frac{3720}{7897}$.

(10)

476 bush. 1 gal. 1 pt. = 30473 pints.
3 bush. 1 pk. 1 qt. = 210 pints.
$30473 \div 210 = 145\frac{23}{210}$.

(11)

6 lbs. 4 oz. 1 dr. = 36540 grs.
1 oz. 7 drs. 1 scr. 7 grs. = 927 grs.
$36540 \div 927 = 39\frac{387}{927}$.

(12)

£9 4s. 7½d. = 8862 far.
3s. 11½d. = 189 far.
$8862 \div 189 = 46\frac{168}{189}$.

(13)

7 acres = 43908480 sq. in.
17 sq. yds. 6 ft. 4 in. = 22900 sq. in.
$43908480 \div 22900 = 1917\frac{9180}{22900}$.

(14)

927 m. 4 fur. 7 per. = 58767786 inches.
6 m. 3 inches = 380163 inches.
$58767786 \div 380163 = 154\frac{221684}{380163}$.

(15)

11 years 47 days 1 hour = 97555 hours.
23 weeks 2 days 7 hours = 3919 hours.
$97555 \div 3919 = 24\frac{499}{919}$.

(16)

167 bush. 1 pk. = 5352 qts.
9 bush. 1 qt. = 289 qts.
$5352 \div 289 = 18\frac{150}{289}$.

(17)

17 tons = 1360 qrs.
14 cwt. 3 qrs. = 59 qrs.
$1360 \div 59 = 23\frac{3}{59}$.

(18)

126 yards 1 qr. 2 na. = 9099 half-inches.
17 French ells 1 qr. 1 in. = 1856 half-inches.
$9099 \div 1856 = 4\frac{1675}{1856}$.

(19)

963 m. 420 yds. = 1695300 yds.
7 fur. 63 yds. = 1603 yds.
$1695300 \div 1603 = 1057\frac{929}{1603}$.

(20)

£1111 11s. 11¼d. = 1067133 far.
£12 13s. 4½d. = 12162 far.
$1067133 \div 12162 = 87\frac{2039}{12162}$.

EXERCISE 27.

(1)

$1789 \times 3 = 5367$ qrs. by $9 = 48303$ in. $\div 12$
$= 4025\frac{1}{4}$ feet.

(5)

$75000 \times 123 = 922500$ grs. = 160 lbs. 1 oz.
17 dwt. 12 gr.

(7)

$1120 \times 11 = 12320$ ft. = 2 miles 2 fur. 26 per. 3 yds. 2 ft.

(8)

$24902\frac{1}{2}$ miles $\times$ 8 $\times$ 40 $\times$ $5\frac{1}{2}$ $\times$ 3 $\times$ 12 = 1577822400 inches = 1577822400 cents = \$15778224.

1577822400 $\div$ 100 = 15778224 lbs. = 7889 tons 2 cwt. 24 lbs.

(9)

There are *five* twenty-cent pieces in \$1.

\$794671 $\times$ 5 = 3973355 pieces.

3973355 $\div$ 108 = $36790\frac{35}{108}$ minutes = 3 weeks 4 days 13 hours 10 min. $19\frac{48}{108}$ sec.

(10)

\$2·17 $\times$ 365 = \$792·05.

(11)

4 oz. 1 dwt. 6 grs. $\times$ 3 $\times$ 12 = 12 lbs. 2 oz. 5 dwt.

(12)

1 lb. tea @ 75 cents.....	\$0·75
3 lbs. coffee @ 14 "	0·42
6 lbs. rice @ 5 "	0·30
27 lbs. sugar @ 11 "	2·97
19 lbs. raisins at 13 "	2·47
1 brl. flour at \$7·20.....	7·20
Sum =	\$14·11

(14)

271496 $\div$ 167 = $1625\frac{121}{167}$ times.

(15)

9167 $\times$ 714 = 6545238.

(16)

67 acres 4 per. 17 yds. $\div$ 9 = 7 a. 1 r. 31 per. 18 yds. 6 ft. 36 in.

(17)

From £16 11s.
Take 4 2

Rem. = £12 9 = sum to be equally divided among the three.

£12 9s. ÷ 3 = £4 3s. = share of 1st and 2nd.
3rd person gets £4 3s. + £4 2s. = £8 5s.

(18)

$744 ÷ 6 = $124 = share of first.
$744 — $124 = $620 = remainder.
$620 ÷ 4 = $155 = share of second.
$620 — $155 = $465 = remainder.
$465 ÷ 2 = $232·50 = share of each of the others.

(19)

176 × 400 = 704·00
4s. × 20 = ·80
5¾ = 23 far. × 5 ÷ 12 = .09 7/12

∴ £176 4s. 5¾d. = $704·89 7/12

A has $704·89 7/12
B has 694·70
Diff. = 10·19 7/12

(20)

ds.	qrs.	na.		yds.	qrs.	na.
4	1	3	× 7 =	31	0	1
		10				
44	1	2	× 4 =	177	2	0
		10				
4	3	0	× 1 =	443	3	0
		10				
4437	2	0	× 1 =	4437	2	0
			Sum =	5189	3	1

(21)

$7196·40 = 719640 cents ÷ 100 = 7196⅖ lbs.
71 cwt. 96⅖ lbs. = 3 tons 11 cwt. 3 qrs. 21 lbs. 6 oz. 6⅖ drs.

(22)

7 miles 4 fur. 17 per. = 13293½ yds ÷ 2 = 6646¼ fath.

(23)

Dividend = Quotient × Divisor.
= 749 × 47 = 35203.

(24)

$\overline{\text{X}}$MMCI = 12101
16701 — 12101 = 4600.

(25)

Subtrahend = Minuend — Remainder.
= 71467 — 61794 = 9673.

(26)

$679 — $146 = $533 = twice the share of the second.
$533 ÷ 2 = $266·50 = share of second.
$266·50 + $146 = $412·50 = share of first.

(27)

714 + 16 + 179 + 42 + 93 = 1044
91467 — 234 — 946 — 1127 — 80040 + 27 — 67 + 83 = 91577 — 8241 = 9163
1044 × 9163 = 9566172

(28)

71496 ÷ 60 = 1191$\frac{36}{60}$ = 1191⅗ bush.

(30)

1746 — 974 = 772

(31)

s. 11d. × 23 = £7 19s. 1d.

(32)

$62\frac{1}{2} \div 10 = 6\frac{1}{4}$ gallons = 1 cubic foot.
$748 \times 6\frac{1}{4} = 4675$ gallons.

(33)

1 mile = 1760 yds; $1760 \div 5 = 352$
$352 \times 2 = 704$ = number of feet *A* gains while *B* is running a mile.
704 ft. = $234\frac{2}{3}$ yds. = whole number of yds. gained.
But he started 17 yds. behind *B*.
Therefore at end of race he will be $234\frac{2}{3} - 17 = 217\frac{2}{3}$ yds. before *B*.

(34)

A is to have as much as *B* and *C* together, hence *A* is to have half.
$\$749{\cdot}60 \div 2 = \$374{\cdot}80$ = *A*'s share.
Remainder = $\$374{\cdot}80 \div 2 = \$187{\cdot}40$ = share of *B* or *C*.

(35)

$2 + 5 + 7 = 14$, hence as often as 14 is contained times in 2366 the first receives 2, the second 5, and the third 7.
$2366 \div 14 = 169$
$169 \times 2 = 338$ cub. ft. = share of first.
$169 \times 5 = 845$ cub. ft. = share of second.
$169 \times 7 = 1183$ cub. ft. = share of third.

(36)

a.	r.	per.
1	1	17
17	0	23
21	1	0
39	3	0

	a.	r.
From	247	0
Take	39	3
Rem.	207	1

$1 \div 3 = 69$

a.	r.	p.	yds.	in.
69	0	18	10	108

(37)

1120 × 17 = 19040 ft. = 6346 yds. 2 ft. = 1153 per. $4\frac{1}{2}$ yds. 2 ft. = 1153 per 5 yds. 0 ft. 6 in. = 3 miles 4 fur. 33 per. 5 yds. 6 in.

(38)

12000 × 313 = 3756000 = copies sold.
3756000 × 5 = 18780000d = sum realized.
18780000d = £78250
£78250 × 4 = $313000

(39)

710 — 297 = 413

(40)

Weight = 219 × 3000 = 657000 grs. = 114lbs. 15dwt.
2s. $9\frac{1}{2}$d. × 3000 = £418 15s = $1675·00
$1675·00 × 500 = $837500

(41)

£1 × 400 = 400
7s. × 20 = 140
$4\frac{1}{2}$d = 18 far. × 5 ÷ 12 = $7\frac{1}{2}$

$\therefore$ £1 7s. $4\frac{1}{2}$d. = $5·47\frac{1}{2}$
$5·47\frac{1}{2}$ × 297 = $1626·02\frac{1}{2}$
$1626·02\frac{1}{2}$ ÷ $3·17 = $162602\frac{1}{2}$ cents ÷ 317 cents = 325205 cents ÷ 634 cents = $512\frac{307}{634}$ brls. of flour.

Exercise 28.

(1)

1024)2240(2
2048
192)1024(5
960
64)192(3
192
G. C. M. = 64

(2)

1902)24409(12
1902
5389
3804
1585)1902(1
1585
317)1585(5
1585
G. C. M. = 317

(3)

1624)14500(8
12992
1508)1624(1
1508
116)1508(13
116
348

348
348
G. C. M. = 116

(4)

4609)8393(1
4609
3784)4609(1
3784
825)3784(4
3300
484)825(1
484
341)484(1
321
143)341(2
286
55)143(2
110
33)55(1
33
22)33(1
22
11)22(2
22
G. C. M. = 11

(5)

714)1176(1
714
462)714(1
462
252)462(1
252
210)252(1
210
42)210(5
210
G. C. M. = 42

(6)

219)11476(52
1095
526
438
88)219(2
176
43)88(2
86
2)43(21
42
1)2(1
G. C. M. = 1

(7)

194706)289913(1
194706

95207)194706(2
190414

4292)95207(22
8584

9367
8584
---
783)4292(5
3915
---
377)783(2
754
---
29)377(13
29

87
87

G. C. M. = 29

(8)

2925)29484(10
2925
---
234)2925(12
234

585
468
---
117)234(2
234

G. C. M. = 117

(9)

1725)27525(15
1725

10275
8625

1650)1725(1
1650
---
75)1650(22
150

150
150

G. C. M. = 75

(10)

2254)71001(31
6762

3381
2254

1127)2254(2
2254

G. C. M. = 1127

(11)

11256) 19899 (1
11256
8643) 11256 (1
8643
2613) 8643 (3
7839
204) 2613 (3
2412
201) 804 (4
804

G. C. M. = 201

(12)

5161) 7175 (1
5161
2594) 5161 (1
2594
2567) 2594 (1
2567
27) 2567 (95
243
137
135
2) 27 (13
26
1) 2 (2
1

G. C. M. = 1

(13)

87147)178871(2
174294

4577)87147(19
4577

41377
41193

184)4577(24
368

897
736

161)184(1
161

23)161(7
161

G. C. M. = 23

(14)

663)1261(1
663

598)663(1
598

65)598(9
585

13)65(5
65

G. C. M. = 13

(15)

918)1347(1
918

429)918(2
858

60)429(7
420

9)60(6
54

6)9(1
6

3)6(2
6

G. C. M. = 3

(16)
187)255(1
187
68)187(2
136
51)68(1
51
17)51(3
51
G. C. M. = 17

(17)
1914)35786(18
1914
16646
15312
1334)1914(1
1334
580)1334(2
1160
174)580(3
522
58)174(3
174
G. C. M. = 58

(18)
21671)22111(1
21671
440)21671(49
1760
4071
3960
111)440(3
333
107)111(1
107
4)107(26
104
3)4(1
3
1)3(3
3
G. C. M. = 1

(19)

582)82159(141
582
2395
2328
679
582
97)582(6
582

G. C. M. = 97

(20)

212(452(2
424
28)212(7
196
16)28(1
16
12)16(1
12
4)12(3
12

G. C. M. = 4

Exercise 29.

(1)

6)6 .. 9 .. 30
15) 3 .. 5

l. c. m. = 6 × 15 = 90

(2)

30)30 .. 55
11

l. c. m. = 30 × 11 = 330

(3)

21)7 .. 21 .. 35 .. 4 .. 20
5 20

l. c. m. = 21 × 20 = 420

(4)

16)2 .. 9 .. 16 .. 35 .. 56 .. 63
35) 35 7 63

l. c. m. = 16 × 35 × 9 = 5040

(5)

12)2 .. 4 .. 6 .. 8 .. 10 .. 12 .. 16 .. 18 .. 20
4 3 5

l. c. m. = 12 × 4 × 3 × 5 = 720

(6)

99)8 .. 9 .. 11 .. 22 .. 72 .. 32 .. 99

8 .. 8 .. 32 ..

l. c. m. = 99 × 32 = 3168.

(7)

32)6 .. 10 .. 14 .. 18 .. 22 .. 28 .. 32

3 .. 5 .. .. 9 .. 11 .. 7 ..

l. c. m. = 32 × 5 × 9 × 11 × 7 = 110880.

(8)

30)4 .. 10 .. 15 .. 20 .. 25 .. 30 .. 35 .. 40

5 .. .. 7 .. 4

l. c. m. = 30 × 5 × 7 × 4 = 4200.

(9)

6)1 .. 2 .. 3 .. 4 .. 5 .. 6 .. 7 .. 8 .. 9

5 .. .. 7 .. 4 .. 3

l. c. m. = 6 × 7 × 4 × 3 × 5 = 2520.

(10)

48)3 .. 6 .. 9 .. 12 .. 48 .. 21 .. 24 .. 16

.. 3 .. .. .. 7 ..

l. c. m. = 48 × 3 × 7 = 1008.

(11)

160)8 .. 21 .. 63 .. 40 .. 160 .. 240 .. 300

63) .. .. 63 .. .. .. 8 .. 15

5

l. c. m. = 160 × 63 × 5 = 50400.

(12)

16)16 .. 41 .. 38

.. 41 .. 19

l. c. m. = 16 × 41 × 19 = 12464.

(13)

l. c. m. = 9 × 16 = 144.

(14)

72)112 .. 200 .. 72

14 .. 25 ..

l. c. m. = 72 × 14 × 25 = 25200.

(15)

90)90 .. 36 .. 63 .. 12½ .. 7

.. 2 .. 7 .. ..

l. c. m. = 90 × 2 × 7 = 1260.

(16)

3 .. 5 .. 7 .. 9 .. 11

l. c. m. = 5 × 7 × 9 × 11 = 3465.

(17)

18)2 .. 4 .. 6 .. 8 .. 10 .. 12 .. 14 .. 16 .. 18 .. 20 .. 22 .. 24 .. 26 .. 28 .. 30 .. 32

16) .. .. 10 .. 11 .. 12 .. 13 .. 14 .. 15 .. 16

5 .. 11 .. .. 13 .. 7 .. ..

l. c. m. = 18 × 16 × 5 × 11 × 13 × 7 = 1441440

(18)

25)25 .. 7 .. 44 .. 60 .. 63 .. 55 .. 9 .. 11 .. 28 .. 70 .. 4

44) .. .. 44 .. 12 .. 63 .. 11 .. .. .. 28 .. 14 ..

9 .. 63 .. .. 7 .. ..

l. c. m. = 25 × 44 × 63 = 69300.

(19)

720)720 .. 396 .. 252 .. 540

.. 11 .. 7 .. 3

l. c. m. = 720 × 11 × 7 × 3 = 166320.

(20)

30)15 .. 12 .. 128 .. 30 .. 16 .. 4 .. 320 .. 96

.. .. 64 .. .. 32 .. 16

l. c. m. = 30 × 64 = 1920.

EXERCISE 33.

(1)

$\frac{1540}{3740} = \frac{154}{374} = \frac{77}{187} = \frac{7}{17}$ (dividing in succession by 10, 2, and 11, or at once by 220).

(2)

$\frac{1764}{6546} = \frac{2352}{8728} = \frac{294}{1091}$ (dividing in succession by 2 and 3 or at once by their G. C. M. 6).

(3)

$\frac{3307}{4331}$, the terms have no common measure, therefore the fraction cannot be reduced.

(4)

$\frac{2117}{7689} = \frac{713}{851} = \frac{31}{37}$ (dividing in succession by 9 and 23 or at once by 207 the G. C. M. of the terms).

(5)

$\frac{2302}{118} = \frac{1251}{59}$ (dividing by 2).

(6)

$\frac{27237}{405453} = \frac{23}{3407}$ (dividing each term by 119).

(7)

$\frac{3073}{7091} = \frac{139}{1013}$ (dividing each term by 7).

(8)

$\frac{366579}{399867} = \frac{12193}{13289} = \frac{89}{97}$ (dividing in succession by 3 and 137, or at once by 411, the G. C. M. of the terms).

(9)

$\frac{2317}{6119} = \frac{17}{29}$ (dividing each term by 211).

(10)

$\frac{1537}{701}$; the terms have no common measure, and therefore the fraction cannot be reduced.

(11)

$\frac{584169}{1119983} = \frac{59}{113}$ (dividing both terms by 991, their G.C.M.)

(12)

$\frac{19591}{27169} = \frac{101}{269}$ (dividing both terms by 101, their G.C.M.)

EXERCISE 34.

(1)

l. c. m. of 2, 4, 5, and 10 = 20.

Then multiplier for 1st fraction $= \frac{20}{2} = 10$; for 2nd $= \frac{20}{4} = 5$; for 3rd $= \frac{20}{5} = 4$; and for 4th $= \frac{20}{10} = 2$.

$\frac{1 \times 10}{2 \times 10} = \frac{10}{20}$; $\frac{3 \times 5}{4 \times 5} = \frac{15}{20}$; $\frac{4 \times 4}{5 \times 4} = \frac{16}{20}$; $\frac{7 \times 2}{10 \times 2} = \frac{14}{20}$.

(2)

l. c. m. of 5, 7, 9, 3, and 2 = 630.

$\frac{630}{5} = 126$; $\frac{630}{7} = 90$; $\frac{630}{9} = 70$; $\frac{630}{3} = 210$; and $\frac{630}{2} = 315$.

$\frac{2 \times 126}{5 \times 126} = \frac{252}{630}$; $\frac{3 \times 90}{7 \times 90} = \frac{270}{630}$; $\frac{4 \times 70}{9 \times 70} = \frac{280}{630}$;

$\frac{2 \times 210}{3 \times 210} = \frac{420}{630}$; $\frac{1 \times 315}{2 \times 315} = \frac{315}{630}$.

(3)

l. c. m. of 18, 7, 9, 6, 14 = 126.

$\frac{126}{18} = 7$; $\frac{126}{7} = 18$; $\frac{126}{9} = 14$; $\frac{126}{6} = 21$; $\frac{126}{14} = 9$.

$\frac{7 \times 7}{18 \times 7} = \frac{49}{126}$; $\frac{6 \times 18}{7 \times 18} = \frac{108}{126}$; $\frac{5 \times 14}{9 \times 14} = \frac{70}{126}$;

$\frac{5 \times 21}{6 \times 21} = \frac{105}{126}$; $\frac{3 \times 9}{14 \times 9} = \frac{27}{126}$.

(4)

l. c. m. of 24, 12, 5, 3, 10, 18 = 360.

$\frac{360}{24} = 15$; $\frac{360}{12} = 30$; $\frac{360}{5} = 72$; $\frac{360}{3} = 120$;

$\frac{360}{10} = 36$; $\frac{360}{18} = 20$.

(Continued on next page.)

(4 continued.)

$$\frac{7 \times 15}{24 \times 15} = \frac{105}{360}; \quad \frac{11 \times 30}{12 \times 30} = \frac{330}{360}; \quad \frac{3 \times 72}{5 \times 72} = \frac{216}{360};$$

$$\frac{2 \times 120}{3 \times 120} = \frac{240}{360}; \quad \frac{7 \times 36}{10 \times 36} = \frac{252}{360}; \quad \frac{13 \times 20}{18 \times 20} = \frac{260}{360}.$$

(5)

l. c. m. of 2, 15, 36, 9, and 5 = 180.

$$\frac{180}{20} = 9; \quad \frac{180}{10} = 18; \quad \frac{180}{15} = 12; \quad \frac{180}{36} = 5; \quad \frac{180}{9} = 20;$$

$$\frac{180}{5} = 36.$$

$$\frac{17 \times 9}{20 \times 9} = \frac{153}{180}; \quad \frac{9 \times 18}{10 \times 18} = \frac{162}{180}; \quad \frac{4 \times 12}{15 \times 12} = \frac{48}{180};$$

$$\frac{23 \times 5}{36 \times 5} = \frac{115}{180}; \quad \frac{5 \times 20}{9 \times 20} = \frac{100}{180}; \quad \frac{4 \times 36}{5 \times 36} = \frac{144}{180}.$$

(6)

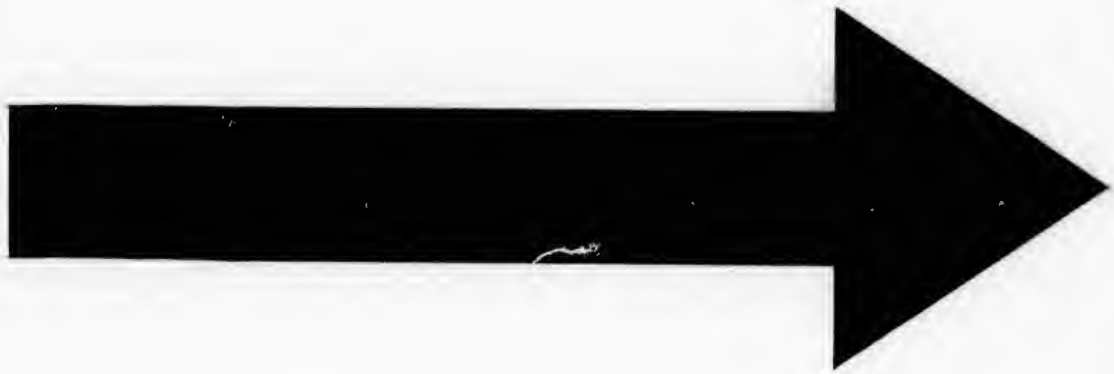
l. c. m. of 3, 4, 5, 6, 8 and 10 = 120.

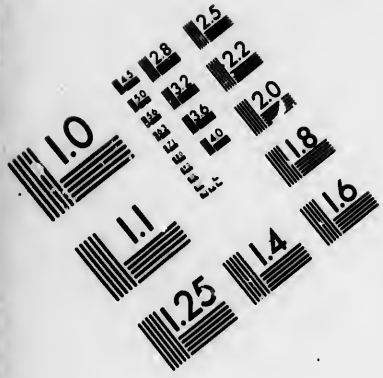
$$\frac{120}{3} = 40; \quad \frac{120}{4} = 30; \quad \frac{120}{5} = 24; \quad \frac{120}{6} = 20;$$

$$\frac{120}{8} = 15; \quad \frac{120}{10} = 12.$$

$$\frac{1 \times 40}{3 \times 40} = \frac{40}{120}; \quad \frac{1 \times 30}{4 \times 30} = \frac{30}{120}; \quad \frac{1 \times 24}{5 \times 24} = \frac{24}{120}; \quad \frac{1 \times 20}{6 \times 20}$$

$$= \frac{20}{120}; \quad \frac{1 \times 15}{8 \times 15} = \frac{15}{120}; \quad \frac{1 \times 12}{10 \times 12} = \frac{12}{120}.$$





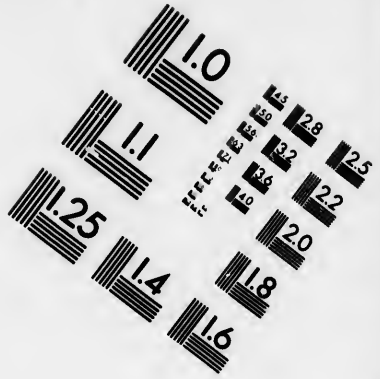
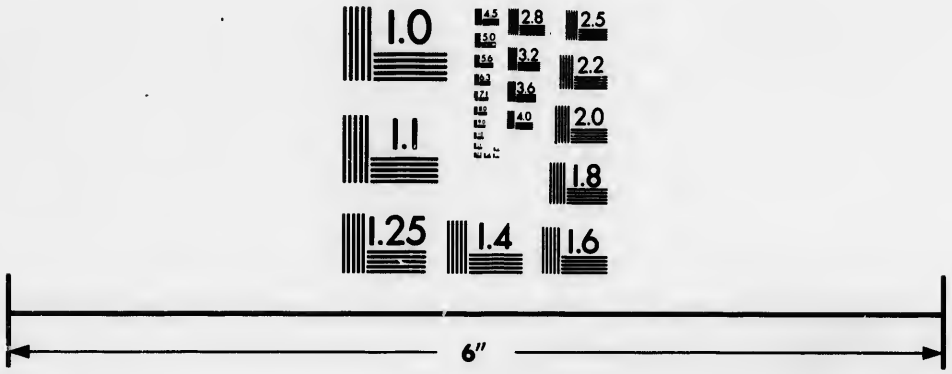
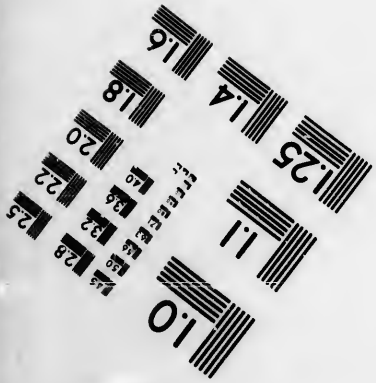
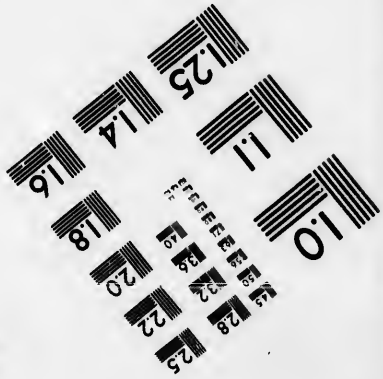


IMAGE EVALUATION TEST TARGET (MT-3)







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(7)

l. c. m. of 3, 4, 5 and 6 = 60.

$$\frac{60}{3} = 20;\ \frac{60}{4} = 15;\ \frac{60}{5} = 12;\ \frac{60}{6} = 10.$$

$$\frac{2 \times 20}{3 \times 20} = \frac{40}{60};\ \frac{3 \times 15}{4 \times 15} = \frac{45}{60};\ \frac{4 \times 12}{5 \times 12} = \frac{48}{60};\ \frac{5 \times 10}{6 \times 10} = \frac{50}{60}.$$

(8)

l. c. m. of 8, 9, 10, 12, 15 and 18 = 360.

$$\frac{360}{8} = 45;\ \frac{360}{9} = 40;\ \frac{360}{10} = 36;\ \frac{360}{12} = 30;$$

$$\frac{360}{15} = 24;\ \frac{360}{18} = 20.$$

$$\frac{7 \times 45}{8 \times 45} = \frac{315}{360};\ \frac{8 \times 40}{9 \times 40} = \frac{320}{360};\ \frac{9 \times 36}{10 \times 36} = \frac{324}{360};$$

$$\frac{11 \times 30}{12 \times 30} = \frac{330}{360};\ \frac{13 \times 24}{15 \times 24} = \frac{312}{360};\ \frac{17 \times 20}{18 \times 20} = \frac{340}{360}.$$

(9)

l. c. m. of 13, 17, 19 = 4199.

$$\frac{4199}{13} = 323;\ \frac{4199}{17} = 247;\ \frac{4199}{19} = 221.$$

$$\frac{11 \times 323}{13 \times 323} = \frac{3553}{4199};\ \frac{14 \times 247}{17 \times 247} = \frac{3458}{4199};\ \frac{16 \times 221}{19 \times 221} = \frac{3536}{4199}$$

(10)

l. c. m. of 17, 10, 16 and 12 = 4080.

$$\frac{4080}{17} = 240; \quad \frac{4080}{10} = 408; \quad \frac{4080}{16} = 255; \quad \frac{4080}{12} = 340.$$

$$\frac{12 \times 240}{17 \times 240} = \frac{2880}{4080}; \quad \frac{9 \times 408}{10 \times 408} = \frac{3672}{4080}; \quad \frac{15 \times 255}{16 \times 255} = \frac{3825}{4080};$$

$$\frac{7 \times 340}{12 \times 340} = \frac{2380}{4080}.$$

(11)

l. c. m. of 10, 12, 15 and 21 = 420.

$$\frac{420}{10} = 42, \quad \frac{420}{12} = 35; \quad \frac{420}{15} = 28; \quad \frac{420}{21} = 20.$$

$$\frac{9 \times 42}{10 \times 42} = \frac{378}{420}; \quad \frac{11 \times 35}{12 \times 35} = \frac{385}{420}; \quad \frac{13 \times 28}{15 \times 28} = \frac{364}{420};$$

$$\frac{16 \times 20}{21 \times 20} = \frac{320}{420}.$$

(12)

l. c. m. of 5, 7, 11, 9, 3, 14 and 22 = 6930.

$$\frac{6930}{5} = 1386; \quad \frac{6930}{7} = 990; \quad \frac{6930}{11} = 630; \quad \frac{6930}{9} = 770;$$

$$\frac{6930}{3} = 2310; \quad \frac{6930}{14} = 495; \quad \frac{6930}{22} = 315.$$

$$\frac{2 \times 1386}{5 \times 1386} = \frac{2772}{6930}; \quad \frac{4 \times 990}{7 \times 990} = \frac{3960}{6930}; \quad \frac{6 \times 630}{11 \times 630} = \frac{3780}{6930};$$

(Continued on next page.)

(12 continued.)

$$\frac{4 \times 770}{9 \times 770} = \frac{3080}{6930}; \quad \frac{2 \times 2310}{3 \times 2310} = \frac{4620}{6930}; \quad \frac{11 \times 495}{14 \times 495}$$

$$= \frac{5445}{6930}; \quad \frac{17 \times 315}{22 \times 315} = \frac{5355}{6930}$$

EXERCISE 35.

(1)

STATEMENT.

$$\frac{1 \times 4 \times 27 \times 10 \times 7}{3 \times 9 \times 40 \times 13 \times 5} =$$

CANCELLED.

$$\frac{1 \times \cancel{4} \times \overset{3}{\cancel{27}} \times \cancel{10} \times 7}{\cancel{3} \times \cancel{9} \times \underset{\cancel{4}}{\cancel{40}} \times 13 \times 5} = \frac{7}{13 \times 5} = \frac{7}{65}$$

(2)

STATEMENT.

$$\frac{1 \times 1 \times 4 \times 15 \times 34}{2 \times 3 \times 5 \times 17 \times 19} =$$

CANCELLED.

$$\frac{1 \times 1 \times 4 \times \overset{3}{\cancel{15}} \times \overset{2}{\cancel{34}}}{\cancel{2} \times \cancel{3} \times \cancel{5} \times \cancel{17} \times 19} = \frac{4}{19}$$

(3)

STATEMENT.

$$\frac{2 \times 1 \times 14 \times 9 \times 32}{7 \times 4 \times 61 \times 16 \times 1} =$$

CANCELLED.

$$\frac{\overset{1}{\cancel{2}} \times 1 \times \overset{2}{\cancel{14}} \times 9 \times \overset{2}{\cancel{32}}}{\underset{1}{\cancel{7}} \times \underset{2}{\cancel{4}} \times 61 \times \underset{1}{\cancel{16}} \times 1} = \frac{2 \times 9}{61} = \frac{18}{61}$$

(4)

STATEMENT.

$$\frac{17 \times 1 \times 3 \times 9 \times 22}{7 \times 9 \times 34 \times 11 \times 1} =$$

CANCELLED.

$$\frac{\overset{1}{\cancel{17}} \times 1 \times 3 \times \overset{1}{\cancel{9}} \times \overset{2}{\cancel{22}}}{7 \times \underset{1}{\cancel{9}} \times \underset{2}{\cancel{34}} \times \underset{1}{\cancel{11}} \times 1} = \frac{3}{7}$$

(5)

STATEMENT.

$$\frac{2 \times 4 \times 55 \times 1}{5 \times 11 \times 2 \times 4} =$$

CANCELLED.

$$\frac{\overset{1}{\cancel{2}} \times \overset{1}{\cancel{4}} \times \overset{1}{\cancel{55}} \times 1}{\underset{1}{\cancel{5}} \times \underset{1}{\cancel{11}} \times \underset{1}{\cancel{2}} \times \underset{1}{\cancel{4}}} = \frac{1}{1} = 1$$

(6)

STATEMENT.

$$\frac{2 \times 31 \times 97 \times 1}{11 \times 9 \times 2 \times 31} =$$

CANCELLED.

$$\frac{\cancel{2} \times \cancel{31} \times 97 \times 1}{11 \times 9 \times \cancel{2} \times \cancel{31}} = \frac{97}{11 \times 9} = \frac{97}{99}$$

(7)

STATEMENT.

$$\frac{\overset{1}{\cancel{3}} \quad \overset{4}{\cancel{16}}}{\cancel{27} \times \cancel{64} \times 1 \times 7 \times 13} = \frac{13 \times 3}{2} = \frac{39}{2} = 19\tfrac{1}{2}.$$
$$\cancel{4} \times \cancel{7} \times 8 \times \cancel{9} \times \cancel{4}$$

CANCELLED.

(8)

STATEMENT.

$$\frac{109 \times 1 \times 11 \times \overset{17}{\cancel{153}}}{4 \times \cancel{9} \times 17 \times \underset{20}{\cancel{220}}} = \frac{109}{4 \times 20} = \frac{109}{80} = 1\tfrac{29}{80}.$$

CANCELLED.

(9)

STATEMENT.

$$\frac{2 \times 35 \times 45 \times 1}{11 \times 4 \times 7 \times 25} =$$

CANCELLED.

$$\frac{\cancel{2} \times \overset{7}{\cancel{35}} \times \overset{9}{\cancel{45}} \times 1}{11 \times \underset{2}{\cancel{4}} \times \cancel{7} \times \underset{5}{\cancel{25}}} = \frac{9}{11 \times 2} = \frac{9}{22}$$

(10)

STATEMENT.

$$\frac{1 \times 2 \times 3 \times 4 \times 5 \times 8}{2 \times 3 \times 4 \times 5 \times 6 \times 11} =$$

CANCELLED.

$$\frac{1 \times \cancel{2} \times \cancel{3} \times \cancel{4} \times \cancel{5} \times \overset{4}{\cancel{8}}}{\cancel{2} \times \cancel{3} \times \cancel{4} \times \cancel{5} \times \underset{3}{\cancel{6}} \times 11} = \frac{4}{3 \times 11} = \frac{4}{33}$$

(11)

STATEMENT.

$$\frac{9 \times 7 \times 13 \times 21 \times 31}{4 \times 2 \times 3 \times 4 \times 5} =$$

CANCELLED.

$$\frac{\overset{3}{\cancel{9}} \times 7 \times 13 \times 21 \times 31}{4 \times 2 \times \cancel{3} \times 4 \times 5} = \frac{177723}{160} = 1110\tfrac{123}{160}.$$

(12)

STATEMENT.

$$\frac{\cancel{25} \times \overset{5}{\cancel{35}} \times \overset{13}{\cancel{65}} \times 11 \times \overset{4}{\cancel{16}} \times 1}{7 \times \cancel{4} \times \cancel{7} \times \cancel{13} \times \cancel{25} \times \underset{5}{\cancel{25}}}$$

CANCELLED.

$$= \frac{11 \times 4}{7} = \frac{44}{7} = 6\tfrac{2}{7}$$

Exercise 36.

(1)

$$\frac{2}{\frac{3}{5}} = \frac{\frac{2}{1}}{\frac{3}{5}} = \frac{2 \times 5}{1 \times 3} = \tfrac{10}{3} = 3\tfrac{1}{3}.$$

(2)

$$\frac{\frac{7}{9}}{11} = \frac{\frac{7}{9}}{\frac{11}{1}} = \frac{7 \times 1}{9 \times 11} = \frac{7}{99}$$

(3)

$$\frac{\frac{4}{7}}{\frac{9}{11}} = \frac{4 \times 11}{7 \times 9} = \frac{44}{63}$$

(4)

$$\frac{2\frac{3}{4}}{7} = \frac{\frac{11}{4}}{\frac{7}{1}} = \frac{11 \times 1}{4 \times 7} = \frac{11}{28}$$

(5)

$$\frac{9}{3\frac{3}{11}} = \frac{\frac{9}{1}}{\frac{36}{11}} = \frac{\overset{3}{\cancel{9}} \times 11}{\underset{4}{\cancel{36}} \times 1} = \frac{11}{4} = 2\frac{3}{4}.$$

(6)

$$\frac{2\frac{1}{5}}{19\frac{3}{7}} = \frac{\frac{11}{5}}{\frac{136}{7}} = \frac{11 \times 7}{5 \times 136} = \frac{77}{680}$$

(7)

$$\frac{6\frac{4}{5}}{7\frac{3}{9}} = \frac{\frac{34}{5}}{\frac{65}{9}} = \frac{34 \times 9}{5 \times 65} = \frac{306}{325}$$

(8)

$$\frac{4\frac{3}{7}}{9\frac{1}{2}} = \frac{\frac{31}{7}}{\frac{19}{2}} = \frac{31 \times 2}{7 \times 19} = \frac{62}{133}$$

(9)

$$\frac{6\frac{1}{2}}{7\frac{1}{2}} = \frac{\frac{13}{2}}{\frac{9}{1}} = \frac{13 \times 1}{2 \times 9} = \frac{13 \times 1 \times \overset{1}{\cancel{2}}}{\underset{1}{\cancel{2}} \times 9 \times 15} = \frac{13}{9 \times 15} = \frac{13}{135}$$

(10)

$$\frac{4\frac{2}{3}}{7\frac{1}{2}} = \frac{4\frac{2}{3}}{3\frac{1}{4}} = \frac{\frac{14}{3}}{\frac{15}{4} \times \frac{4}{13}} = \frac{\frac{14}{3} \times \frac{2}{4} \times 13}{9 \times 15 \times \frac{4}{2}} = \frac{19 \times 13}{9 \times 15} = \frac{247}{135} = 1\frac{112}{135}.$$

(11)

$$\frac{2\frac{7}{4}}{4\frac{1}{3}} = \frac{\frac{29}{11}}{\frac{13}{3}} = \frac{29 \times 3}{11 \times 13} = \frac{87}{143}$$

(12)

$$\frac{6\frac{2}{5}}{3\frac{1}{2}} = \frac{\frac{32}{5}}{\frac{7}{2}} = \frac{32 \times 2}{5 \times 7} = \frac{32 \times 2 \times 2}{5 \times 7 \times 15} = \frac{32 \times 2 \times 2 \times 4 \times 7}{5 \times 7 \times 15 \times 37 \times 1} = \frac{512}{2775}$$

$$\frac{7\frac{1}{2}}{9\frac{1}{4}} = \frac{\frac{15}{2}}{\frac{37}{4}} = \frac{\frac{15}{2}}{37 \times 1} = \frac{\frac{15}{2}}{4 \times 7}$$

$$\frac{9\frac{1}{4}}{7} = \frac{\frac{37}{4}}{\frac{7}{1}}$$

Exercise 37.

(1)

$$\frac{7}{11} \text{ day} = \frac{7}{11 \times 7} = \frac{1}{11} \text{ week.}$$

(2)

$$\frac{4}{29} \text{ cwt.} = \frac{4 \times 4}{29} = \frac{16}{29} \text{ qr.}$$

(3)

$\frac{3}{7}$ of $\frac{14}{25}$ of $\frac{5}{4}$ of a yard $= \frac{1}{5}$ yard.

Then $\frac{1}{5}$ yard $= \frac{1 \times 4}{5} = \frac{4}{5}$ qr.

And $\frac{4}{5}$ of a qr. $= \frac{4}{5 \times 3} = \frac{4}{15}$ of a Fl. ell.

(4)

$\frac{3}{4}$ of $\frac{5}{17}$ of $\frac{14}{19}$ of a mile $= \frac{15}{38}$ of a mile.

Then $\frac{15}{38}$ mile $= \frac{15 \times 8 \times 40}{38} = \frac{2400}{19}$ per.

(5)

$\frac{4}{5}$ of $\frac{7}{8}$ of $3\frac{1}{2}$ inches $= \frac{49}{20}$ inches.

Then $\frac{49}{20}$ in. $= \frac{49}{20 \times 12 \times 3} = \frac{49}{720}$ yds.

(6)

$\frac{3}{7}$ of $\frac{3}{5}$ of $\frac{6\frac{1}{2}}{4\frac{3}{4}}$ of 6 oz. $= \frac{117}{133}$ oz.

$\frac{1}{2}$ of $\frac{2}{7}$ of $\frac{3}{4}$ of a scr. $= \frac{3}{28}$ of a scr.

Then $\frac{117}{133}$ oz. $\div \frac{3}{28} = \frac{117 \times 8 \times 3 \times 28}{133 + 3} = \frac{3744}{19}$.

(7)

$\frac{7}{10}$ of $\frac{4}{11}$ of $\frac{1}{6}$ of $\frac{2\frac{1}{2}}{\frac{1}{7}}$ of a pt. $= \frac{49}{66}$ of a pt.

$\frac{3}{4}$ of $\frac{2}{5}$ of $\frac{4\frac{3}{4}}{7\frac{1}{2}}$ of a bush. $= \frac{19}{100}$ of a bush.

$\frac{49}{66}$ pt. $= \frac{49}{66 \times 2 \times 4 \times 2 \times 4 \times \frac{19}{100}}$ of a bush. $=$

$\frac{49}{20064} = \frac{49 \times 25}{20064} = \frac{1225}{20064}$.

(8)

$\frac{3}{7}$ of $\frac{4}{11}$ of $6\frac{3}{4}$s. $= \frac{54}{77}$ of a s.

Then $\frac{54}{77}$ of a s. $= \frac{54}{77 \times 20} = \frac{27}{770}$ of a £.

(9)

$\frac{5}{11}$ of $4\frac{1}{4}$ hrs. $= \frac{95}{44}$ hrs.

Then $\frac{95}{44}$ hrs. $= \frac{95}{44 \times 24 \times 7} = \frac{95}{7392}$ of a week.

(10)

$\frac{3}{4}$ of a lb. $= \frac{1}{2}$ of a lb., and $\frac{1}{7}$ of $\frac{3}{8}$ of $\frac{4\frac{1}{2}}{6\frac{7}{8}}$ of $\frac{9\frac{1}{2}}{\frac{3}{11}}$ of a dwt.

$= \frac{323}{280}$ of a dwt.

Then $\frac{1}{2}$ of a lb. $\div \frac{323}{280}$ dwt. $= \frac{1 \times 12 \times 20 \times 280}{2 \times 323} = \frac{33600}{323}$

(11)

$\frac{6}{7}$ of $4\frac{3}{4}$ of $\frac{9\frac{1}{4}}{16\frac{1}{2}}$ of $\frac{33}{37}$ of an acre $= \frac{57}{28}$ acres.

Then $\frac{57}{28}$ a. $\div \frac{3}{7}$ sq. yds. $= \frac{57 \times 4 \times 40 \times 30\frac{1}{4} \times 7}{28 \times 3} = 22220$

(12)

$\frac{4\frac{1}{2}}{7}$ of $\frac{6}{3\frac{3}{4}}$ of $\frac{\frac{1}{7}}{\frac{1}{5}}$ of $\frac{7}{9}$ of a far. $= \frac{36}{35}$ of a far.

Then $\frac{36}{35}$ of a far. $= \frac{36}{35 \times 4 \times 12 \times 20} = \frac{3}{2800}$ of a £.

EXERCISE 38.

(1)

2 hrs. 17 min. = 137 min.
1 wk. 17 hrs. = 11100 "
Therefore the answer is $\frac{137}{11100}$.

(2)

19 lbs. 7 oz. 21 grs. = 112821 grs.
11 lbs. 7 oz. 9 dwt. = 66936 ".
Therefore the answer is $\frac{112821}{66936} = \frac{37607}{22312} = 1\frac{15215}{22312}$.

(3)

6 per. 16 yds. 2 ft. 11 in. = 256259 in.
7 r. 14 per. = 11525976 in.
Therefore the answer is $\frac{256259}{11525976}$.

(4)

3 qrs. 1 na. 1 in. = $30\frac{1}{4}$ in.
3 Eng. e. 1 qr. 2 na. = $146\frac{1}{4}$ in.
Therefore the answer is $\frac{30\frac{1}{4}}{146\frac{1}{4}} = \frac{11}{54}$

(5)

27 wks. 2 dys. 4 hrs. 7 min. = 275287 min.
1 year = 525960 "
Therefore the answer is $\frac{275287}{525960}$.

(6)

2 qts. 1 pt. = 5 pts.
7 bus. 1 pk. = 464 pts.
Therefore the answer is $\frac{5}{464}$.

(7)

1 lb. 1 oz. = 17 oz.
3 cwt. 3 qrs. 17 lbs. = 6272 oz.
Therefore the answer is $\frac{17}{6272}$.

(8)

£176 18s. 7½d. = 84927 half-pence.

£217 19s. 11d. = 104638 "

Therefore the answer is $\frac{84927}{104638}$.

(9)

6s. 11¼d. = 335 farthings.

Therefore 17 far. is $\frac{17}{335}$ of 6s. 11¾d.

(10)

1 a. = 4840 yds.

Therefore 27 yds. = $\frac{27}{4840}$ of 1 acre.

(11)

7 drs. 1 scr. 17 grs. = 457 grs. and 7 lbs. 4 oz. 7 drs. = 42660 grs.

Therefore 7 drs. 1 scr. 17 grs. is $\frac{457}{42660}$ of 7 lbs. 4 oz. 7 drs.

(12)

$\frac{1}{2}$ of $\frac{3}{5}$ of $\frac{1}{4}$ of £7 8s. 3¼d. = $\frac{1}{4}$ of 7117 farthings = $\frac{7117}{4}$ far.

$\frac{3}{5}$ of $\frac{3}{7}$ of $\frac{17\frac{1}{2}}{6}$ of £6 7s. 8½d. = $\frac{1}{2}$ of 6130 far. = 3065 far.

Therefore the answer is $\frac{\frac{7117}{4}}{3065} = \frac{7117}{12260}$.

(13)

$\frac{3}{7}$ of $\frac{3}{8}$ of $\frac{8}{8}$ of $\frac{8}{30}$ of 1 qr. 17 lbs. $= \frac{1}{10}$ of 42 lbs. $= \frac{21}{5}$ lbs.

$\frac{1}{2}$ of $\frac{2}{5}$ of $\frac{10}{13}$ of 6 cwt. 1 qr. $= \frac{2}{13}$ of 625 lbs. $= \frac{1250}{13}$ lbs.

Therefore the answer is $\frac{\frac{21}{5}}{\frac{1250}{13}} = \frac{273}{6250}$

(14)

$\frac{3}{11}$ of $\frac{4}{9}$ of $\frac{16\frac{1}{2}}{20}$ of 6 roods 17 per. $= \frac{1}{10}$ of $7774\frac{1}{4}$ yds.

$= \frac{31097}{40}$ yds.

$\frac{7}{11}$ of $\frac{8}{3}$ of $\frac{33}{56}$ of $\frac{3}{7}$ of 9 acres 11 yds. $= \frac{3}{7}$ of 43571 yds.

$= \frac{87142}{7}$ yds.

Therefore the answer is $\frac{\frac{31097}{40}}{\frac{87142}{7}} = \frac{\frac{2827}{40}}{\frac{7922}{7}} = \frac{19789}{317688}$.

(15)

$\frac{3}{5}$ of $7\frac{1}{2}$ of $8\frac{3}{4}$ of $\frac{1}{5}$ of $\frac{16}{25}$ of 17 cord feet $= \frac{21}{5}$ of 272 cub. ft. $= \frac{5712}{5}$ cub. ft.

$\frac{9}{11}$ of $5\frac{1}{2}$ of $\frac{1}{3}$ of 3 cords 56 cub. ft. $= \frac{3}{2}$ of 440 cub. ft.

$= 660$ cub. ft.

Therefore the answer is $\frac{\frac{5712}{5}}{660} = \frac{476}{275} = 1\frac{201}{275}$.

EXERCISE 39.

(1)

wk.	dys.
7) 1	0

1 day.

(2)

$\frac{1}{2}$ of $\frac{3}{4}$ of a bush. $= \frac{3}{8}$ bush.

3 bush. $\div$ 8 $=$ 1 pk. 1 gal.

(3)

$\frac{2}{5}$ of $\frac{1}{7}$ of $\frac{9\frac{1}{2}}{3\frac{1}{4}}$ of a hhd. $= \frac{304}{455}$ hhd.

hhd.

455)304 bar. gal. qts. pts. $\frac{336}{455}$

2(1 10 2

608

455

153

$31\frac{1}{2}$

4819$\frac{1}{2}$

4550

$269\frac{1}{2}$

4

1078

910

168

2

336

(4)

$\frac{1}{11}$ of $8\frac{1}{4}$ lbs. $= \frac{3}{4}$ lb. and 3 lbs. $\div$ 4 $=$ 9 oz.

(5)

$\frac{2}{7}$ of $\frac{3}{11}$ of $\frac{8\frac{1}{2}}{17}$ of an acre $= \frac{3}{77}$ acres.

a.
77)3 per. yds. ft. in.
4(6 7 0 $92\frac{4}{7}$.

12
40
480
462
18
$30\frac{1}{4}$
$544\frac{1}{2}$
539
$5\frac{1}{2}$
9
$49\frac{1}{2}$
144
7128
693
198
154
$\frac{44}{77} = \frac{4}{7}$.

(6)

$\frac{1}{4}$ of $\frac{3}{17}$ of $6\frac{3}{5}$ of $\frac{4}{17}$ of a French ell $= \frac{9}{85}$ of a Fr. ell.

Fr.	e.	na.	in.
85)9(	2		$1\frac{37}{170}$
	6		
	54		
	4		
	216		
	170		
	46		
	$2\frac{1}{4}$		
	$103\frac{1}{2}$		
	85		
	$18\frac{1}{2}$		

$$\frac{18\frac{1}{2}}{85} = \frac{37}{170}$$

(7)

$\frac{3}{4}$ of $\frac{3}{5}$ of a £ $= \frac{3}{10}$ of a £

£3 ÷ 10 = 6s.

(8)

$7\frac{1}{2}$ of $3\frac{5}{8}$ of $\frac{9\frac{1}{2}}{7\frac{1}{4}}$ of an acre $= 2\frac{85}{8}$ acres.

a.	r.	per.
8)285	0	0
35	2	20

(9)

$7\frac{7}{7}$ of $9\frac{1}{2}$ of $\frac{7}{38}$ of a mile $= \frac{53}{4}$ mile.

	miles.	fur.
4)	53	0
	13	2

(10)

$\frac{2}{5}$ of $\frac{3}{7}$ of $\frac{1}{3}$ of 35 cwt. $= \frac{8}{3}$ cwt.

	cwt.	qrs.	lbs.	oz.	drs.
3)	8	0	0	0	0
	2	2	16	10	$10\frac{2}{3}$

(11)

$\frac{2}{11}$ of $\frac{8}{7}$ of a lb. $= \frac{16}{77}$ of a lb.

	lbs.	oz.	drs.	scr.	grs.
77)	16	0	0	0	0
		2	3	2	$16\frac{68}{77}$

(12)

$\frac{3\frac{1}{2}}{7\frac{1}{5}}$ of $\frac{36}{35}$ of $\frac{2}{11}$ of $\frac{1}{7}$ of a £ $= \frac{4}{77}$ of a £

	£	s.	d.
77)	4	0	0
		1	$0\frac{36}{77}$

EXERCISE 40.

(1)

$\frac{1}{2} + \frac{3}{7} + \frac{4}{11} + \frac{5}{6} + \frac{7}{9}$

These fractions reduced to a common denominator become

$\frac{693}{1386} + \frac{594}{1386} + \frac{504}{1386} + \frac{1155}{1386} + \frac{1078}{1386} = \frac{4024}{1386} = \frac{2012}{693} = 2\frac{626}{693}$.

(2)

$\frac{2}{3} + \frac{2}{5} + \frac{2}{7} + \frac{2}{9} + \frac{2}{11} + \frac{2}{13}$.

These fractions reduced to a common denominator become

$\frac{2310}{3465} + \frac{1386}{3465} + \frac{990}{3465} + \frac{770}{3465} + \frac{630}{3465} + \frac{462}{3465}$

$= \frac{6548}{3465} = 1\frac{3083}{3465}$.

(3)

$\frac{1}{4} + \frac{3}{5} + \frac{5}{6} + \frac{2}{3} + \frac{7}{10}$.

These fractions reduced to a common denominator become

$\frac{15}{60} + \frac{36}{60} + \frac{50}{60} + \frac{40}{60} + \frac{42}{60} = \frac{183}{60} = \frac{61}{20} = 3\frac{1}{20}$.

(4)

$\frac{2}{5} + 1\frac{3}{4} + 2\frac{1}{7} + 9\frac{1}{2} = 1 + 2 + 9 + \frac{2}{5} + \frac{3}{4} + \frac{1}{7} + \frac{1}{2} =$

$12 + \frac{56}{140} + \frac{105}{140} + \frac{20}{140} + \frac{70}{140} = 12 + \frac{251}{140}$

$= 12 + 1\frac{111}{140} = 13\frac{111}{140}$.

(5)

$6\frac{1}{4} + 11\frac{2}{3} + 196\frac{1}{5} + 29\frac{5}{7} = 6 + 11 + 196 + 29 + \frac{1}{4} +$

$\frac{2}{3} + \frac{1}{5} + \frac{5}{7} = 242 + \frac{105 + 280 + 84 + 360}{420} =$

$242 + \frac{829}{420} = 242 + 1\frac{409}{420} = 243\frac{409}{420}$.

(6)

$8\frac{1}{4} + 11\frac{11}{12} + \frac{6}{7} + \frac{4}{5} + 16\frac{5}{9}$

$= 8 + 11 + 16 + \frac{1}{4} + \frac{11}{12} + \frac{6}{7} + \frac{4}{5} + \frac{5}{9}$

$= 35 + \frac{315 + 1155 + 1080 + 1008 + 700}{1260}$

$= 35 + \frac{4258}{1260} = 35 + \frac{2129}{630} = 35 + 3\frac{239}{630} = 38\frac{239}{630}$.

(7)

$196\frac{3}{7} + 16\frac{17}{19} + 20\frac{4}{11} = 196 + 16 + 20 + \frac{3}{7} + \frac{17}{19} + \frac{4}{11}$

$= 232 + \frac{627 + 1309 + 532}{1463} = 232 + \frac{2468}{1463}$

$= 232 + 1\frac{1005}{1463} = 233\frac{1005}{1463}$.

(8)

$200\frac{1}{2} + 763\frac{1}{5} + 916\frac{3}{7} = 200 + 763 + 916 + \frac{1}{2} + \frac{1}{5} + \frac{3}{7}$

$= 1879 + \frac{35 + 14 + 30}{70} = 1879 + \frac{79}{70} = 1879 + 1\frac{9}{70}$

$= 1880\frac{9}{70}$.

(9)

$17\frac{16}{17} + 19\frac{18}{19} + 20\frac{19}{20} + 21\frac{20}{21} = 17 + 19 + 20 + 21 + \frac{16}{17} + \frac{18}{19} + \frac{19}{20} + \frac{20}{21} = 77 + \frac{1276880}{1338660} + \frac{1285320}{1338660} + \frac{1288277}{1338660} + \frac{1292200}{1338660} = 77 + \frac{5142277}{1338660} = 77 + 3\frac{1072297}{1338660} = 80\frac{1072297}{1338660}$.

(10)

$6\frac{1}{3} + 8\frac{1}{4} + 11\frac{3}{4} + 9\frac{1}{5} + 16\frac{2}{7} = 6 + 8 + 11 + 9 + 16 + \frac{1}{3} + \frac{1}{4} + \frac{3}{4} + \frac{1}{5} + \frac{2}{7}$

$= 50 + \frac{140 + 105 + 315 + 84 + 120}{420}$

$= 50 + \frac{764}{420} = 50 + 1\frac{86}{105} = 51\frac{86}{105}$.

(11)

$\frac{1}{2}$ of $\frac{3}{7} + \frac{1}{5}$ of $\frac{4}{9} + \frac{6}{7}$ of $6\frac{2}{7} = \frac{3}{14} + \frac{4}{45} + 5\frac{19}{49}$

$= 5 + \frac{945 + 392 + 1710}{4410} = 5\frac{3047}{4410}$.

(12)

$\frac{2}{5}$ of $\frac{1}{2}$ of $\frac{7}{8} + 9\frac{1}{2} + 6\frac{3}{11} + \frac{2}{7}$ of $\frac{4}{5}$ of $\frac{63}{80} = 9 + 6 + \frac{7}{40} + \frac{1}{2} + \frac{3}{11} + \frac{1}{10} = 15 + \frac{77 + 220 + 120 + 44}{440}$

$= 16\frac{21}{440}$.

(13)

$7\frac{3}{4} + 9\frac{1}{2} + 16\frac{3}{7} + 20\frac{1}{2} + \frac{1}{2}$ of $\frac{2}{3}$ of $\frac{6}{7}$ of $\frac{9}{11} = 7 + 9 + 16 + 20 + \frac{3}{4} + \frac{1}{2} + \frac{3}{7} + \frac{1}{2} + \frac{18}{77}$

$= 52 + \frac{231 + 154 + 132 + 154 + 72}{308}$

$= 52 + \frac{743}{308} = 52 + 2\frac{127}{308} = 54\frac{127}{308}$.

(14)

$$6\tfrac{3}{7} + \tfrac{1}{2} \text{ of } \tfrac{1}{8} \text{ of } 10 + \tfrac{2}{11} \text{ of } \tfrac{6}{11} \text{ of } 242 + 16\tfrac{3}{11}$$

$$= 6\tfrac{3}{7} + 4 + 24 + 16\tfrac{3}{11} = 50 + \frac{33 + 21}{77} = 50\tfrac{54}{77}.$$

(15)

$$111\tfrac{11}{12} + 22\tfrac{2}{3} + 3\tfrac{3}{4} + \tfrac{1}{5} \text{ of } \tfrac{2}{3} \text{ of } \tfrac{3}{4} \text{ of } \tfrac{4}{5} = 111 + 22 + 3 + \tfrac{11}{12} + \tfrac{2}{3} + \tfrac{3}{4} + \tfrac{1}{5} = 136 + \frac{55 + 40 + 45 + 12}{60}$$

$$= 136 + \tfrac{152}{60} = 136 + 2\tfrac{8}{15} = 138\tfrac{8}{15}.$$

(16)

$$67\tfrac{7}{8} + 89\tfrac{9}{10} + 90\tfrac{10}{11} + 101\tfrac{101}{107} = 67 + 89 + 90 + 101 + \tfrac{7}{8} + \tfrac{9}{10} + \tfrac{10}{11} + \tfrac{101}{107}$$

$$= 347 + \frac{41195 + 42372 + 42800 + 44440}{47080}$$

$$= 347 + \tfrac{170807}{47080} = 347 + 3\tfrac{29567}{47080} = 350\tfrac{29567}{47080}.$$

(17)

$$\frac{8\frac{3}{4}}{6\frac{1}{2}} + \frac{9\frac{2}{7}}{8\frac{3}{11}} + \frac{16\frac{1}{5}}{9\frac{3}{7}} = 1\tfrac{9}{26} + 1\tfrac{78}{637} + 1\tfrac{79}{110}$$

$$= 3 + \frac{315315 + 111540 + 654199}{910910}$$

$$= 3 + 1\tfrac{1170144}{910910} = 4\tfrac{1170144}{910910}.$$

(18)

$$\tfrac{1}{2} \text{ of } \tfrac{2}{7} \text{ of } 4 + 6\tfrac{1}{2} \text{ of } 9\tfrac{3}{7} + 18\tfrac{1}{4} + \tfrac{20}{21}$$

$$= \tfrac{4}{7} + 61\tfrac{3}{7} + 18\tfrac{1}{4} + \tfrac{20}{21} = 79 + \frac{48 + 24 + 21 + 80}{84}$$

$$= 79 + 2\tfrac{5}{84} = 81\tfrac{5}{84}.$$

(19)

$$2\tfrac{3}{4} + \frac{16\frac{1}{4}}{13} + \frac{7\frac{1}{2}}{8\frac{2}{7}} + \tfrac{5}{12} \text{ of } \tfrac{7}{11} \text{ of } 1\tfrac{32}{175} = 2\tfrac{3}{4} + 1\tfrac{1}{4} + \tfrac{105}{118} + \tfrac{1}{8}$$

$$= 4 + \frac{525 + 118}{590} = 4\tfrac{643}{590} = 5\tfrac{53}{590}.$$

(20)

$$\frac{4\frac{1}{4}}{\frac{1}{7}} \text{ of } \frac{6\frac{1}{2}}{11} + 9\tfrac{5}{6} + 11\tfrac{1}{2} + 16\tfrac{3}{7} + \frac{6\frac{3}{7}}{4\frac{1}{8}}$$

$$= 175\tfrac{1}{88} + 9\tfrac{5}{6} + 11\tfrac{1}{2} + 16\tfrac{3}{7} + 1\tfrac{11}{31}$$

$$= 54 + \frac{1071 + 1540 + 924 + 792 + 968}{1848}$$

$$= 54 + \tfrac{5295}{1848} = 54 + 2\tfrac{533}{616} = 56\tfrac{533}{616}.$$

EXERCISE 41.

(1)

$$1\tfrac{7}{11} - \tfrac{4}{17} = \tfrac{119}{187} - \tfrac{44}{187} = \tfrac{75}{187}.$$

(2)

$$\tfrac{5}{6} \text{ of } \tfrac{1}{3} - \tfrac{2}{3} \text{ of } \tfrac{1}{5} = \tfrac{10}{9} - \tfrac{2}{15} = \tfrac{50}{45} - \tfrac{6}{45} = \tfrac{44}{45}.$$

(3)

$$\tfrac{3}{11} \text{ of } 6\tfrac{3}{4} - \tfrac{1}{2} \text{ of } 2\tfrac{3}{7} = 1\tfrac{37}{44} - 1\tfrac{3}{14} = 1\tfrac{259}{308} - 1\tfrac{66}{308} = \tfrac{193}{308}.$$

(4)

$$169\tfrac{3}{7} - 23\tfrac{17}{18} = 168 + 1\tfrac{3}{7} - 23\tfrac{17}{18}$$

$$= 168\tfrac{162}{126} - 23\tfrac{119}{126} = 145\tfrac{43}{126}.$$

(5)

$$229\tfrac{1}{16} - 67\tfrac{33}{24} = 228 + 1\tfrac{1}{16} - 67\tfrac{33}{24}$$

$$= 226\tfrac{17}{48} - 67\tfrac{66}{48} = 161\tfrac{65}{48}.$$

(6)

$$1116\tfrac{1}{4} - 229\tfrac{146}{171} = 1115 + 1\tfrac{1}{4} - 229\tfrac{146}{171}$$
$$= 1115\tfrac{855}{684} - 229\tfrac{584}{684} = 886\tfrac{271}{684}.$$

(7)

$$11\tfrac{11}{13} - 1\tfrac{13}{14} = 10 + 1\tfrac{11}{13} - 1\tfrac{13}{14}$$
$$= 10\tfrac{336}{182} - 1\tfrac{169}{182} = 9\tfrac{167}{182}.$$

(8)

$$196\tfrac{1}{2} - \frac{14\frac{1}{2}}{16\frac{1}{7}} \text{ of } \frac{11\frac{2}{3}}{9\frac{1}{2}} = 196\tfrac{1}{2} - 1\tfrac{439}{4620}$$
$$= 196\tfrac{2169}{4620} - 1\tfrac{439}{4620} = 195\tfrac{1831}{4620}.$$

(9)

$$\tfrac{3}{7} \text{ of } \tfrac{1}{3} \text{ of } 18\tfrac{3}{11} \text{ of } 2\tfrac{29}{67} - \tfrac{7}{8} \text{ of } \tfrac{1}{4} \text{ of } \tfrac{84}{7} \text{ of } \tfrac{31}{6}$$
$$= 16 - 10\tfrac{1}{3} = 5\tfrac{2}{3}.$$

(10)

$$\tfrac{1}{2} + \tfrac{2}{3} + \tfrac{7}{10} - \tfrac{7}{11} + \tfrac{4}{7} - \tfrac{6}{17} - \tfrac{9}{10}$$
$$= \tfrac{1}{2} + \tfrac{2}{3} + \tfrac{7}{10} + \tfrac{4}{7} - (\tfrac{7}{11} + \tfrac{6}{17} + \tfrac{9}{10})$$
$$= \frac{210 + 280 + 294 + 240}{420} - \frac{1190 + 660 + 1683}{1870}$$
$$= \tfrac{1024}{420} - \tfrac{3533}{1870} = 2\tfrac{46}{105} - 1\tfrac{1663}{1870}$$
$$= 1 + 1\tfrac{46}{105} - 1\tfrac{1663}{1870} = 1\tfrac{56474}{39270} - 1\tfrac{34923}{39270} = \tfrac{21551}{39270}.$$

(11)

$$16\tfrac{1}{2} + 4\tfrac{3}{9} + 16\tfrac{3}{8} + 20\tfrac{1}{5} - 17\tfrac{4}{11}$$
$$= 16 + 4 + 16 + 20 - 17 + \tfrac{1}{2} + \tfrac{1}{3} + \tfrac{3}{8} + \tfrac{1}{5} - \tfrac{4}{11}$$
$$= 39 + \frac{660 + 440 + 495 + 264 - 480}{1320}.$$
$$= 39\frac{1859 - 480}{1320} = 39\tfrac{1379}{1320} = 40\tfrac{59}{1320}.$$

(12)

$$4\tfrac{1}{3} \text{ of } \frac{16\frac{1}{2}}{11\frac{3}{5}} - \tfrac{2}{7} \text{ of } \frac{16\frac{1}{4}}{17\frac{1}{4}} = \tfrac{13}{3} \text{ of } \tfrac{165}{116} - \tfrac{2}{7} \text{ of } \tfrac{65}{71}$$

$$= 6\tfrac{19}{116} - \tfrac{130}{497} = 5 + 1\tfrac{19}{116} - \tfrac{130}{497}$$

$$= 5\tfrac{67095}{57652} - \tfrac{15080}{57652} = 5\tfrac{52015}{57652}.$$

(13)

$$\tfrac{1}{2} \text{ of } \tfrac{1}{3} \text{ of } \tfrac{8}{7} \text{ of } 16\tfrac{2}{7} - 11\tfrac{1}{4} + 7\tfrac{6}{7} + 11\tfrac{1}{10} - \tfrac{2}{5}$$

$$= 1_{1}\tfrac{5}{47} + 7\tfrac{6}{7} + 11\tfrac{1}{10} - (11\tfrac{1}{4} + \tfrac{2}{5})$$

$$= 19 + \frac{50 + 1260 + 147}{1470} - \left(11 + \frac{5+8}{20}\right)$$

$$= 19\tfrac{1457}{1470} - 11\tfrac{13}{20} = 19\tfrac{2914}{2940} - 11\tfrac{1911}{2940} = 8\tfrac{1003}{2940}.$$

(14)

$$96\tfrac{3}{8} - \tfrac{1}{2} \text{ of } \tfrac{6}{7} \text{ of } \tfrac{4}{9} \text{ of } 63 + \tfrac{3}{11} + 18\tfrac{1}{2} - 17\tfrac{16}{19}$$

$$= 96\tfrac{3}{8} + \tfrac{3}{11} + 18\tfrac{1}{2} - 12 - 17\tfrac{16}{19}$$

$$= 114 + \frac{33 + 24 + 44}{88} - 29\tfrac{16}{19} = 114\tfrac{101}{88} - 29\tfrac{16}{19}$$

$$= 114\tfrac{1919}{1672} - 29\tfrac{1408}{1672} = 85\tfrac{511}{1672}.$$

(15)

$$\tfrac{11}{12} \text{ of } \frac{8\frac{3}{4}}{7\frac{1}{8}} - \tfrac{9}{11} \text{ of } \frac{6\frac{1}{2}}{8\frac{3}{7}} = \tfrac{385}{342} - \tfrac{819}{1298}$$

$$= \frac{249865 - 140049}{221958} = \tfrac{109816}{221958} = \tfrac{54908}{110979}.$$

(16)

$$4\tfrac{3}{4} \text{ of } 6\tfrac{1}{2} \text{ of } 7\tfrac{2}{9} - \tfrac{2}{3} \text{ of } 8\tfrac{6}{7} \text{ of } 11 = 222\tfrac{71}{72} - 64\tfrac{20}{21}$$

$$= 222\tfrac{497}{504} - 64\tfrac{480}{504} = 158\tfrac{17}{504}.$$

Exercise 42.

(1)

$$\frac{1}{2} \times \frac{3}{7} \times \frac{9}{11} \times \frac{4}{81} \times \frac{9}{1}$$

$$= \frac{1}{\cancel{2}} \times \frac{3}{7} \times \frac{\cancel{9}}{11} \times \frac{\cancel{4}}{\cancel{81}} \times \frac{\cancel{9}}{1} = \frac{3 \times 2}{7 \times 11} = \frac{6}{77}$$

(2)

$$\frac{2}{7} \times \frac{4}{11} = \frac{2 \times 4}{7 \times 11} = \frac{8}{77}.$$

(3)

$$\frac{6}{11} \times 2\frac{1}{2} \times \frac{4}{7} \times 3\frac{1}{2} = \frac{\cancel{3}}{\cancel{6}} \times \frac{9}{11} \times \frac{\cancel{4}}{\cancel{7}} \times \frac{\cancel{7}}{\cancel{2}}$$

$$= \frac{3 \times 9}{11} = \frac{27}{11} = 2\frac{5}{11}.$$

(4)

$$6\frac{2}{7} \times 4\frac{3}{11} \times 77 \times 4\frac{1}{4} = \frac{\cancel{11}}{\cancel{4}\cancel{4}} \times \frac{47}{\cancel{11}} \times \frac{\cancel{77}}{1} \times \frac{17}{\cancel{4}}$$

$$= \frac{11 \times 47 \times 17}{1} = 8789.$$

(5)

$$3 \times 7\frac{1}{2} \times \frac{11}{15} \times 3\frac{8}{11} = \frac{3}{1} \times \frac{\cancel{15}}{2} \times \frac{\cancel{11}}{\cancel{15}} \times \frac{41}{\cancel{11}}$$

$$= \frac{3 \times 41}{2} = \frac{123}{2} = 61\frac{1}{2}.$$

(6)

$$9\tfrac{3}{8} \times \tfrac{4}{11} \times 2 \times \tfrac{3}{17} \times \tfrac{24}{25} = \frac{\overset{3}{\cancel{75}}}{\underset{2}{\cancel{8}}} \times \frac{\overset{1}{\cancel{4}}}{11} \times \frac{\overset{1}{\cancel{2}}}{1} \times \frac{3}{17} \times \frac{24}{\underset{1}{\cancel{25}}}$$

$$= \frac{3 \times 3 \times 24}{11 \times 17} = \tfrac{216}{187} = 1\tfrac{29}{187}.$$

(7)

$$8\tfrac{3}{4} \times 9\tfrac{1}{2} \times 10\tfrac{1}{2} \times \frac{1}{9\frac{1}{2}} = \frac{35}{4} \times \frac{\overset{19}{\cancel{21}}}{\underset{2}{\cancel{2}}} \times \frac{31}{3} \times \frac{\overset{1}{\cancel{2}}}{\underset{19}{\cancel{19}}}$$

$$= \frac{35 \times 31}{4 \times 3} = \tfrac{1085}{12} = 90\tfrac{5}{12}.$$

(8)

$$\tfrac{6}{7} \text{ of } \tfrac{1}{3} \text{ of } (\tfrac{1}{2} + \tfrac{3}{5}) \times \tfrac{9}{11} \times \tfrac{7}{18}$$

$$= \frac{\overset{1}{\cancel{6}}}{\underset{1}{\cancel{7}}} \times \frac{\overset{2}{\cancel{4}}}{3} \times \frac{7}{\underset{1}{\cancel{6}}} \times \frac{\overset{1}{\cancel{9}}}{11} \times \frac{\overset{1}{\cancel{7}}}{\underset{2}{\cancel{18}}} = \frac{2 \times 7}{3 \times 11} = \tfrac{14}{33}.$$

(9)

$$27\tfrac{3}{5} \times 98\tfrac{3}{11} = \tfrac{138}{5} \times \tfrac{1081}{11} = \tfrac{149178}{55} = 2712\tfrac{18}{55}.$$

(10)

$$16\tfrac{1}{2} \times 8\tfrac{1}{4} \times \frac{17}{22} \times \frac{19}{10\frac{1}{2}} = \frac{\overset{11}{\cancel{33}}}{2} \times \frac{\overset{3}{\cancel{33}}}{4} \times \frac{17}{\underset{2}{\cancel{22}}} \times \frac{\overset{19}{\cancel{33}}}{\underset{7}{\cancel{21}}}$$

$$= \frac{11 \times 3 \times 17 \times 19}{2 \times 4 \times 7} = \tfrac{12673}{56} = 190\tfrac{13}{56}.$$

(11)

$$(11\tfrac{1}{2} + 6\tfrac{1}{5}) \times (9\tfrac{2}{5} - 7\tfrac{1}{7}) = 17\tfrac{7}{10} \times 2\tfrac{18}{35} = \frac{143}{8} \times \frac{86}{35}$$

$$= \frac{143 \times 43}{4 \times 35} = \frac{6149}{140} = 43\tfrac{129}{140}.$$

(12)

$$\frac{4\tfrac{3}{4}}{7\tfrac{1}{2}} \times \frac{6\tfrac{1}{2}}{\tfrac{1}{4}} \times \tfrac{1}{2} \text{ of } 3\tfrac{1}{7} \text{ of } 9\tfrac{1}{5} = \frac{19}{80} \times \frac{26}{1} \times \frac{1}{2} \times \frac{12}{7} \times \frac{8}{5}$$

$$= \frac{19 \times 26 \times 12 \times 8}{5 \times 7 \times 5} = \frac{47424}{175} = 270\tfrac{174}{175}.$$

(13)

$$6\tfrac{3}{7} \text{ of } 8\tfrac{3}{4} \times 9\tfrac{1}{2} \text{ of } \frac{16}{8\tfrac{3}{4}} = \frac{11}{7} \times \frac{35}{4} \times \frac{19}{2} \times \frac{32}{35}$$

$$= \frac{11 \times 19 \times 32}{7} = \frac{6688}{7} = 955\tfrac{3}{7}.$$

(14)

$$\tfrac{1}{2} \text{ of } \tfrac{3}{5} \text{ of } \tfrac{5}{7} \times \tfrac{8}{9} \times \tfrac{10}{11} \times 693$$

$$= \frac{1}{2} \times \frac{3}{5} \times \frac{3}{7} \times \frac{8}{9} \times \frac{2}{11} \times \frac{7}{1}$$

$$= \frac{3 \times 3 \times 8 \times 2}{1} = 144.$$

(15)

$$(4\tfrac{3}{4} - 2\tfrac{1}{9}) \times 2\tfrac{1}{3} \text{ of } 4\tfrac{1}{2} \text{ of } (7\tfrac{1}{4} - 6\tfrac{1}{5}) = \frac{19}{\cancel{95}} \times \frac{7}{3} \times \frac{\cancel{3}}{\cancel{9}} \times \frac{7}{\cancel{21}} = \frac{19 \times 7 \times 7}{4 \times 2 \times 4} = \frac{931}{32} = 29\tfrac{3}{32}.$$

(16)

$$6\tfrac{3}{11} \text{ of } \frac{4\tfrac{1}{4}}{7\tfrac{3}{8}} \text{ of } \frac{1}{9\tfrac{1}{4}} \text{ of } \frac{8\tfrac{3}{5}}{9} \times 11\tfrac{1}{7} = \frac{\cancel{23}}{11} \times \frac{34}{59} \times \frac{4}{37} \times \frac{43}{\cancel{45}} \times \frac{\cancel{26}}{7} = \frac{23 \times 34 \times 43 \times 4 \times 26}{11 \times 59 \times 37 \times 5 \times 7} = \frac{3497104}{840455} = 4\tfrac{135284}{840455}.$$

(17)

$$\tfrac{2}{7} \text{ of } \tfrac{3}{11} \text{ of } \frac{37\tfrac{1}{2}}{9\tfrac{1}{6}} \text{ by } \frac{4\tfrac{1}{2}}{7} \times \tfrac{3}{5} \times 1\tfrac{5}{9}$$

$$= \tfrac{2}{7} \times \tfrac{3}{11} \times \frac{\cancel{9}}{11} \times \frac{\cancel{9}}{\cancel{14}} \times \frac{3}{\cancel{5}} \times \frac{\cancel{14}}{\cancel{9}} = \frac{2 \times 3 \times 9 \times 3}{7 \times 11 \times 11} = \frac{162}{847}.$$

(18)

$$\tfrac{2}{5} \times \tfrac{3}{11} \times \tfrac{4}{7} \times \tfrac{9}{13} \times 6\tfrac{1}{2} \times \frac{1}{4\tfrac{1}{2}} \times \frac{1}{\tfrac{3}{14}}$$

$$= \frac{2}{\cancel{5}} \times \frac{\cancel{3}}{11} \times \frac{4}{\cancel{7}} \times \frac{\cancel{9}}{\cancel{13}} \times \frac{\cancel{13}}{\cancel{2}} \times \frac{\cancel{2}}{\cancel{9}} \times \frac{\cancel{2}}{\cancel{3}} = \frac{2 \times 4 \times 2}{5 \times 11} = \frac{16}{55}.$$

(19)

$$\left(6\tfrac{3}{5} + 4\tfrac{1}{2} + 9\tfrac{3}{4}\right) \times \left(6\tfrac{2}{11} + 3\tfrac{1}{7}\right) \times \left(3\tfrac{1}{5} - 2\tfrac{1}{9}\right)$$

$$= 20\tfrac{17}{20} \times 9\tfrac{25}{77} \times 1\tfrac{4}{45} = \frac{\overset{139}{\cancel{417}}}{\underset{10}{\cancel{20}}} \times \frac{\overset{359}{\cancel{718}}}{\underset{11}{\cancel{77}}} \times \frac{\overset{7}{\cancel{49}}}{\underset{15}{\cancel{45}}}$$

$$\frac{139 \times 359 \times 7}{10 \times 11 \times 15} = \tfrac{349307}{1650} = 211\tfrac{1157}{1650}.$$

(20)

$$\left(8\tfrac{3}{11} - 2\tfrac{1}{7} + 3\tfrac{1}{10} - 7\tfrac{2}{5}\right) \times \left(6\tfrac{3}{11} - 2\tfrac{7}{9} + 2 + \tfrac{1}{2}\right)$$

$$\times \left(\tfrac{1}{2} \text{ of } 11\tfrac{1}{2} + \tfrac{6}{7}\right)$$

$$= \left\{\left(8\tfrac{3}{11} + 3\tfrac{1}{10}\right) - \left(2\tfrac{1}{7} + 7\tfrac{2}{5}\right)\right\}$$

$$\times \left\{\left(6\tfrac{3}{11} + 2 + \tfrac{1}{2}\right) - 2\tfrac{7}{9}\right\} \times \left(5\tfrac{3}{4} + \tfrac{6}{7}\right)$$

$$= \left(11\tfrac{41}{110} - 9\tfrac{19}{35}\right) \times \left(8\tfrac{17}{22} - 2\tfrac{7}{9}\right) \times 6\tfrac{17}{28}$$

$$= 1\tfrac{639}{770} \times 5\tfrac{197}{198} \times 6\tfrac{17}{28} = \tfrac{1409}{770} \times \tfrac{1187}{198} \times \tfrac{185}{28}$$

$$= \tfrac{309409355}{4268880} = 72\tfrac{2049995}{4268880} = 72\tfrac{409999}{853776}.$$

Exercise 43.

(1)

$$\tfrac{2}{7} \div \tfrac{4}{11} = \frac{\cancel{2}}{7} \times \frac{11}{\underset{2}{\cancel{4}}} = \tfrac{11}{14}.$$

(2)

$$\tfrac{2}{7} \text{ of } \tfrac{3}{5} \div 4\tfrac{3}{4} = \tfrac{2}{7} \times \tfrac{3}{5} \times \tfrac{4}{19} = \tfrac{24}{665}.$$

(3)

$$7\tfrac{3}{8} \div \tfrac{1}{2} \text{ of } \tfrac{3}{4} \text{ of } 6\tfrac{1}{2} = \frac{59}{\underset{\cancel{2}}{\cancel{8}}} \times \frac{\cancel{2}}{1} \times \frac{\cancel{4}}{3} \times \frac{2}{13} = \tfrac{118}{39} = 3\tfrac{1}{39}.$$

(4)

$$\frac{6}{7} \text{ of } \frac{4}{5} \div \frac{3}{5} \text{ of } \frac{7}{9} = \frac{\overset{2}{\cancel{6}}}{7} \times \frac{4}{5} \times \frac{\cancel{5}}{\cancel{3}} \times \frac{\cancel{9}}{7} = \frac{7}{4}\frac{3}{5} = 1\frac{23}{35}.$$

(5)

$$3\frac{3}{8} \text{ of } 8\frac{1}{2} \div 6\frac{3}{8} \text{ of } 5\frac{3}{7} = \frac{\overset{9}{\cancel{18}}}{5} \times \frac{17}{\cancel{2}} \times \frac{\cancel{5}}{32} \times \frac{7}{38} = \frac{1071}{1216}.$$

(6)

$$\frac{4}{5} \text{ of } 3\frac{7}{8} \text{ of } 9\frac{1}{2} \div \frac{6\frac{3}{4}}{9\frac{7}{7}} = \frac{4}{5} \times \frac{31}{8} \times \frac{19}{2} \div \frac{189}{260}$$

$$= \frac{\overset{2}{\cancel{4}}}{\cancel{5}} \times \frac{31}{\cancel{8}} \times \frac{19}{\cancel{2}} \times \frac{\overset{13}{\cancel{260}}}{189} = \frac{7657}{189} = 40\frac{97}{189}.$$

(7)

$$\frac{2}{5} \text{ of } 8\frac{3}{4} \text{ of } 6\frac{7}{7} \div 4\frac{3}{4} \text{ of } 2\frac{1}{7} = \frac{2}{\cancel{5}} \times \frac{\overset{7}{\cancel{35}}}{\cancel{4}} \times \frac{\overset{3}{\cancel{45}}}{7} \times \frac{\cancel{4}}{19} \times \frac{7}{\cancel{15}}$$

$$= \frac{42}{19} = 2\frac{4}{19}.$$

(8)

$$\left(\frac{1}{2} + \frac{3}{4} + \frac{4}{5} - \frac{6}{7}\right) \div \frac{3}{5} \text{ of } \frac{1}{2} = \left(2\frac{1}{20} - \frac{6}{7}\right) \div \frac{3}{5} \text{ of } \frac{1}{2}$$

$$= \frac{167}{\overset{\overset{20}{140}}{28}} \times \frac{\cancel{5}}{\cancel{2}} \times \frac{\cancel{2}}{1} = \frac{167}{28} = 5\frac{27}{28}.$$

(9)

$$\frac{4\frac{3}{7}}{8\frac{1}{7}} \div \frac{8\frac{1}{8}}{17\frac{5}{8}} = \frac{31}{171} \div \frac{41}{88} = \frac{31}{171} \times \frac{88}{41} = \frac{2728}{7011} = 1\frac{1717}{7011}.$$

(10)

$$8\tfrac{3}{7} \text{ of } 4\tfrac{3}{5} \text{ of } 6\tfrac{1}{4} \div 3\tfrac{1}{7} \text{ of } \frac{6\tfrac{3}{4}}{5\tfrac{1}{3}} = 5\tfrac{8}{7} \text{ of } 2\tfrac{3}{5} \text{ of } 2\tfrac{5}{4} \div 2\tfrac{5}{7} \text{ of } \tfrac{81}{64}$$

$$= 5\tfrac{8}{7} \times 2\tfrac{3}{5} \times 2\tfrac{5}{4} \times \tfrac{7}{25} \times \tfrac{64}{81} = 2\tfrac{134}{405} = 52\tfrac{284}{405}.$$

(11)

$$4\tfrac{1}{4} \div 6\tfrac{1}{2} \text{ of } \tfrac{3}{17} \text{ of } 4\tfrac{1}{4} = \frac{17}{4} \times \tfrac{2}{13} \times \tfrac{11}{3} \times \frac{4}{17} = \tfrac{22}{39}.$$

(12)

$$9\tfrac{1}{4} \text{ of } \frac{8\tfrac{1}{2}}{\tfrac{7}{8}} \div 6\tfrac{3}{5} \text{ of } \frac{4\tfrac{2}{7}}{8\tfrac{1}{4}} = \tfrac{37}{4} \text{ of } \tfrac{68}{7} \div \tfrac{33}{5} \text{ of } \tfrac{10}{77}$$

$$= \tfrac{37}{4} \times \tfrac{68}{7} \times \tfrac{5}{33} \times \tfrac{77}{40} = \tfrac{629}{24} = 26\tfrac{5}{24}.$$

(13)

$$(\tfrac{3}{5} \text{ of } \tfrac{7}{8} \text{ of } 8\tfrac{3}{4}) \div (\tfrac{3}{7} \text{ of } 4\tfrac{3}{5} - \tfrac{19}{20})$$

$$= (\tfrac{3}{5} \text{ of } \tfrac{7}{8} \text{ of } \tfrac{35}{4}) \div (\tfrac{69}{35} - \tfrac{19}{20}) = \frac{3}{5} \times \tfrac{7}{8} \times \frac{7}{\tfrac{35}{4}} \times \frac{35}{143}$$

$$= \tfrac{51}{143} = 4\tfrac{569}{1144}.$$

(14)

$$8\tfrac{3}{4} \text{ of } 6\tfrac{1}{2} \text{ of } 4 \times \tfrac{2}{3} \text{ of } \tfrac{1}{5} \text{ of } \tfrac{1}{13} \times \tfrac{1}{7} \div 6\tfrac{3}{4} \text{ of } \frac{8\tfrac{1}{2}}{7\tfrac{1}{5}} =$$

$$\frac{7}{\tfrac{35}{4}} \times \frac{13}{2} \times \frac{4}{1} \times \frac{2}{3} \times \frac{4}{5} \times \frac{1}{13} \times \frac{1}{7} \times \frac{4}{\tfrac{27}{3}} \times \frac{8}{\tfrac{72}{85}} = \frac{128}{765}.$$

(15)

$$9\tfrac{1}{2} \text{ of } 8\tfrac{3}{4} \text{ of } 6\tfrac{3}{7} \div \frac{8\frac{3}{7}}{6\frac{4}{5}} \text{ of } \frac{6\frac{3}{7}}{4\frac{1}{14}} = \tfrac{19}{2} \times \tfrac{35}{4} \times \tfrac{44}{7} \div \tfrac{145}{119} \text{ of } \tfrac{88}{57}$$

$$= \frac{19}{2} \times \frac{\overset{7}{35}}{\underset{1}{4}} \times \frac{\overset{11}{44}}{\underset{1}{7}} \times \frac{119}{\underset{29}{145}} \times \frac{57}{\underset{8}{88}} = \tfrac{128877}{464} = 277\tfrac{349}{464}.$$

EXERCISE 44.

(1)

$$\tfrac{7}{8} \text{ of } \tfrac{8}{9} \text{ of £1 16s. } 8\tfrac{1}{2}\text{d.} = \tfrac{56}{72} \text{ of £1 16s. } 8\tfrac{1}{2}\text{d.}$$

$$= \frac{\text{£1 16s. } 8\tfrac{1}{2}\text{d.} \times 56}{45} = \text{£2 5s. } 8\tfrac{8}{45}\text{d.}$$

(2)

$$3\tfrac{1}{4} \text{ of } 8\tfrac{1}{2} \text{ of } \tfrac{3}{13} \text{ of } \tfrac{11}{7} \text{ of 4 bush. 1 pk. 1 pt.}$$

$$= \tfrac{33}{8} \text{ of 4 bush. 1 pk. 1 pt.} = \frac{\text{4 bush. 1 pk. 1 pt.} \times 33}{8}$$

$$= 17 \text{ bush. 2 pks. 3 qts. } 0\tfrac{1}{8} \text{ pt.}$$

(3)

$$\tfrac{1}{5} \text{ of } \tfrac{5}{9} \text{ of } 6\tfrac{3}{4} \text{ of } 5\tfrac{3}{7} \text{ of } \tfrac{11}{16} \text{ of 6 lbs. 4 oz.} = \tfrac{33}{35} \text{ of 6 lbs. 4 oz.}$$

$$= \frac{\text{6 lbs. 4 oz.} \times 33}{35} = 5 \text{ lbs. 14 oz. } 4\tfrac{4}{7} \text{ drs.}$$

(4)

$$\tfrac{11}{16} \text{ of } \tfrac{3}{7} \text{ of } \tfrac{8}{33} \text{ of } 6\tfrac{1}{4} \text{ a.} = \tfrac{1}{14} \text{ of 6 a. 1 r.}$$

$$= \frac{\text{6 a. 1 r.} \times 1}{14} = 1 \text{ r. 31 per. 12 yds. 8 ft. } 97\tfrac{5}{7} \text{ in.}$$

(5)

$\frac{1}{2}$ of $\frac{4}{7}$ of 11 cwt. 1 qr. 11 lbs. $= \frac{2}{7}$ of 11 cwt. 1 qr. 11 lbs.

$$= \frac{11 \text{ cwt. } 1 \text{ qr. } 11 \text{ lbs.} \times 2}{7} = 3 \text{ cwt. } 24 \text{ lbs. } 9 \text{ oz. } 2\tfrac{2}{7} \text{ drs.}$$

(6)

$\frac{6}{7}$ of $\frac{4}{5}$ of $1\frac{1}{2}$ of 3 a. 1 r. 27 per. $= \frac{24}{35}$ of 3 a. 1 r. 27 per.

$$= \frac{3 \text{ a. } 1 \text{ r. } 27 \text{ per.} \times 24}{35} = 2 \text{ a. } 23 \text{ per. } 25 \text{ yds. } 83\tfrac{11}{35} \text{ in.}$$

(7)

$6\frac{3}{4}$ of $\frac{11}{18}$ of $\frac{3}{22}$ of £6 11s. $4\frac{3}{4}$d. $= \frac{9}{16}$ of £6 11s. $4\frac{3}{4}$d.

$$= \frac{£6 \text{ 11s. } 4\tfrac{3}{4}\text{d.} \times 9}{16} = £3 \text{ 13s. } 10\tfrac{3}{4}\text{d. } \tfrac{11}{16} \text{ far.}$$

(8)

$6\frac{1}{4}$ of $11\frac{1}{2}$ of $2\frac{1}{4}$ of $\frac{9}{23}$ of 7 m. 4 fur. 17 per.

$= \frac{2025}{32}$ of 7 m. 4 fur. 17 per. $= \frac{7\text{m. } 4\text{fur. } 17 \text{ per.} \times 2025}{32}$

$= 477$ m. 7 fur. 30 per. 4 yds. $10\frac{11}{16}$ in.

(9)

$\frac{1}{2}$ of $\frac{7}{11}$ of 3 lbs. 5 oz. + $6\frac{3}{4}$ of $\frac{11}{27}$ of 6 lbs. 11 oz.

$= \frac{7}{22}$ of 3 lbs. 5 oz. + $\frac{11}{4}$ of 6 lbs. 11 oz.

$$= \frac{3 \text{ lbs. } 5 \text{ oz.} \times 7}{22} + \frac{6 \text{ lbs. } 11 \text{ oz.} \times 11}{4}$$

$= 1$ lb. $13\frac{9}{11}$ drs. + 18 lbs. 6 oz. 4 drs.

$= 19$ lbs. 7 oz. $1\frac{9}{11}$ drs.

(10)

$2\frac{3}{4}$ of $\frac{7}{8}$ of 6 lbs. 11 oz. 4 drs. 1 scr. 16 grs.

$$= \frac{\text{6 lbs. 11 oz. 4 drs. 1 scr. 16 grs.} \times 77}{20}$$

$$= \text{26 lbs. 9 oz. 6 drs. } 6\tfrac{3}{5} \text{ grs.}$$

(11)

$4\frac{3}{4}$ of $5\frac{1}{2}$ of $\frac{7}{19}$ of $\frac{6}{11}$ of 4 yds. 3 qrs. 2 na.

$$= \frac{\text{4 yds. 3 qrs. 2 na.} \times 21}{4} = \text{25 yds. 2 qrs. 1 na. } 1\tfrac{1}{2} \text{ in.}$$

(12)

$7\frac{1}{4}$ of $\frac{1}{14\frac{1}{2}}$ of $6\frac{3}{11}$ of 2 qrs. 17 lbs. 4 oz.

$$= \frac{\text{2 qrs. 17 lbs. 4 oz.} \times 69}{22} = \text{2 cwt. 10 lbs. 14 oz. } 11\tfrac{7}{11} \text{ drs.}$$

(13)

$\frac{7}{18}$ of $6\frac{1}{4}$ of $\frac{18}{28}$ of 21 bush. 3 pks.

$$= \frac{\text{21 bush. 3 pks.} \times 14}{9} = \text{33 bush. 3 pks. 2 qts. } 1\tfrac{1}{3} \text{ pts.}$$

(14)

$\frac{6}{11}$ of $3\frac{1}{4}$ of $\frac{7}{12}$ of $1\frac{1}{3}$ of $\frac{6\frac{1}{4}}{7\frac{1}{8}}$ of 7 wks. 4 d. 5 h.

$$\frac{\text{7wks. 4d. 5h.} \times 175}{228} = \text{5wks. 5d. 20hrs. 9 min. } 12\tfrac{3}{19} \text{sec.}$$

(15)

21 lbs. 11 oz. 7 dwt. $\div \frac{6}{7}$ of $\frac{4}{5}$ of $17\frac{1}{2}$

$= \text{21 lbs. 11 oz. 7 dwt.} \div 12 = \text{1 lb. 9 oz. 18 dwt. 22 grs.}$

(16)

$$4\text{ a. }6\text{ per. }5\text{ yds.} \div 5\tfrac{1}{2} \times \tfrac{2}{7} \times \tfrac{16}{33} = 4\text{a. }6\text{ per. }5\text{ yds.} \div \tfrac{8}{7}$$

$$= \frac{4\text{a. }6\text{per. }5\text{yds.} \times 7}{8} \quad \frac{28\text{a. }1\text{r. }3\text{per. }4\text{yds. }6\text{ft. }108\text{in.}}{8}$$

$$= 3\text{ a. }2\text{ r. }5\text{ per. }11\text{ yds. }8\text{ ft. }63\text{ in.}$$

(17)

$$£169\ 4\text{s. }11\tfrac{1}{2}\text{d.} \div 3\tfrac{1}{4} \text{ of } 6\tfrac{1}{2} \text{ of } \tfrac{110}{169} = £169\ 4\text{s. }11\tfrac{1}{2}\text{d.} \div \tfrac{55}{4}$$

$$= \frac{£169\ 4\text{s. }11\tfrac{1}{2}\text{d.} \times 4}{55} = £12\ 6\text{s. }2\tfrac{8}{55}\text{d.}$$

(18)

$$11\text{ cwt. }2\text{ qrs. }17\text{ lbs.} \times 6\tfrac{3}{4} \text{ of } 4\tfrac{1}{7} \text{ of } \tfrac{1}{127}$$

$$= \frac{11\text{ cwt. }2\text{ qrs. }17\text{ lbs.} \times 783}{3556}$$

$$= 2\text{ cwt. }2\text{ qrs. }6\text{ lbs. }15\text{ oz. }6\tfrac{506}{889}\text{ drs.}$$

Exercise 47.

(1)

18·716
967
34·71
·271
698·7149
23·0067

1742·4186

(2)

278·714
61·9134
217·8167
23·7146
678·906
12·98678

1274·05148

(3)

216·714763
2·9
9867·
91·0986
7·81645
·09868

10185·628493

(4)	(5)	(6)
26·1111	·9167	9·64
11·22222	9·9	9111·77
34·546	8·98	967·769
17·19186	7·614	463·
11·127	·0986	7·0009
816·7142	17·	8·61
	19·11	911·1257
916·91238	963·714	
	1027·3333	11478·9156

(7)	(8)	(9)
167·914	9161·0098	71·0916714
6·8147	7149·16716	27·1471
161·0993	2011·84264	43·9445714

(10)	(11)	(12)
111·1116	279·00906	627·4
22·22222	117·916	91·7469
88·88938	161·09306	535·6531

EXERCISE 48.

(1)

$78417 \times 9 = 705753$, and, since there are three decimal places in the multiplicand and none in the multiplier, the answer is 705·753.

(2)

$271 \times 34 = 9214$, and, as the decimal places in the multiplier and multiplicand number 2, we point off two places in the product and therefore the answer is 92·14.

(3)

21716 × 206 = 4473496, and, since the decimal places in multiplier and multiplicand number 5, the answer is 44·73496.

(4)

11007 × 678 = 7462746, and, since the decimal places in the multiplier and multiplicand number 8, there must be the same number in the product; the number therefore is ·07462746.

(5)

116791 × 8100004 = 946007567164, and, since the decimal places in the multiplier, together with those of the multiplicand, number 8, the answer is 9460·07567164.

(6)

11111 × 97116 = 1079055876, and, since the decimal places in the multiplier, together with the multiplicand, number 7, the answer is 107·9055876.

(7)

27 × 14 × 119 = 44982, and, as in the three factors together, there are four decimal places, the answer is 4·4982.

(8)

342 × 61 × 79 = 1648098, and, since there are nine decimal places in the three factors together, the answer is ·001648098.

(9)

411467 × 61 × 27 = 677686149, and, since there are six decimal places in the three factors together, the product is 677·686149.

(10)

$8008 \times 66 \times 2002 = 1058113056$, and, since there are five decimal places in the three factors together, the product is 10581·13056.

(11)

$1012 \times 719 = 727628$, and, since the decimal places in the multiplier, together with the multiplicand, number 8, the answer is ·00727628.

(12)

$2 \times 7 \times 6 \times 41 = 3444$, and, since there are seven decimal places in the four factors together, the answer is ·0003444.

EXERCISE 49.

(1)

$78·1 \div 1·071 = 78100 \div 1071 = 72·922$, &c.

(2)

$91·142 \div 7·8 = 911·42 \div 78 = 11·684$, &c.

(3)

$61·123 \div ·0146 = 611230 \div 146 = 4186·506$, &c.

(4)

$9·1234 \div ·000716 = 9123400 \div 716 = 12742·178$, &c.

(5)

$·0467 \div ·01471 = 4670 \div 1471 = 3·174$, &c.

(6)

$918 \div 914·71 = 91800 \div 91471 = 1·003$, &c.

(7)

$967·104 \div 12·046 = 967104 \div 12046 = 80·284$, &c.

(8)

$91\cdot671 \div \cdot000916 = 91671000 = 916 = 100077\cdot5109$, &c.

(9)

$8\cdot8 \div \cdot0641 = 88000 \div 641 = 137\cdot285$, &c.

(10)

$7147\cdot12 \div 1127 = 6\cdot341$, &c.

(11)

$\cdot817 \div \cdot9147 = 8170 \div 9147 = \cdot893$, &c.

(12)

$213 \div 91\cdot614 = 213000 \div 91614 = 2\cdot324$, &c.

Exercise 51.

(4)

$$\cdot\dot{1}\dot{2}6 = \frac{126-1}{990} = \tfrac{125}{990} = \tfrac{25}{198}; \quad \cdot\dot{2}\dot{1}\dot{4} = \frac{214-2}{990} = \tfrac{212}{990} = \tfrac{106}{495}.$$

(5)

$$\cdot\dot{2}\dot{1}3\dot{4} = \frac{2132-21}{9900} = \tfrac{2111}{9900}; \quad \cdot216 = \frac{216-21}{900} = \tfrac{195}{900} = \tfrac{13}{60}.$$

$$\cdot\dot{2}\dot{1}\dot{1}\dot{4} = \frac{2114-21}{9900} = \tfrac{2093}{9900}.$$

(6)

$$\cdot\dot{1}2345 = \frac{12345-123}{99000} = \tfrac{12222}{99000} = \tfrac{679}{5500}; \quad \cdot\dot{1}\dot{6}\dot{7}\dot{8} = \tfrac{1678}{9999}.$$

(7)

$$\dot{6}714 = \frac{6714 - 671}{9000} = \frac{6043}{9000}; \quad \dot{1}\dot{2}716 = \frac{12716 - 12}{99900}$$

$$= \frac{12704}{99900} = \frac{3176}{24975}.$$

(8)

$$\ddot{9}186 = \frac{9186 - 91}{9900} = \frac{9095}{9900} = \frac{1819}{1980}; \quad \ddot{1}\ddot{4}2 = \frac{142 - 1}{990}$$

$$= \frac{141}{990} = \frac{47}{330}.$$

(9)

$$\dot{1}2347 = \frac{12347 - 1234}{90000} = \frac{11113}{90000}; \quad \ddot{1}\ddot{2}78 = \frac{1278 - 12}{9900}$$

$$= \frac{1266}{9900} = \frac{211}{1650}.$$

(10)

$$\dot{1}\dot{6}714 = \frac{16714 - 16}{99900} = \frac{16698}{99900} = \frac{2783}{16650};$$

$$\dot{9} = \frac{9}{9} = 1; \quad \ddot{8}\ddot{6} = \frac{86}{99}.$$

(11)

$$27\ddot{4}\ddot{3} = 27\frac{43}{99}; \quad 17\ddot{8}\dot{1}\dot{6} = 17\frac{816-8}{990} = 17\frac{808}{990} = 17\frac{404}{495}$$

(12)

$$467\dot{1}\dot{2}345 = 467\frac{12345-12}{99900} = 467\frac{12333}{99900} = 467\frac{4111}{33300}.$$

$$16\dot{1}\dot{6}\dot{1}\dot{6}1 = 16\frac{16161-16}{99900} = 16\frac{16145}{99900} = 16\frac{3229}{19980}.$$

Exercise 52.

(1)

$$\dot{9} = \tfrac{9}{9} = 1, \quad \dot{6}\dot{5} = \frac{65 - 6}{90} = \tfrac{59}{90}.$$

Hence $\dot{9} + \dot{6}\dot{5} = 1 + \tfrac{59}{90} = 1\tfrac{59}{90}$.

(2)

$9\cdot\dot{1}\dot{2} = 9\tfrac{4}{33}$; $\cdot\dot{7}\dot{2}\dot{5} = \tfrac{352}{495}$; hence $9\cdot\dot{1}\dot{2} + \cdot\dot{7}\dot{2}\dot{5}$
$= 9\tfrac{4}{33} + \tfrac{352}{495} = 9\tfrac{60}{495} + \tfrac{352}{495} = 9\tfrac{412}{495}$.

(3)

$6\cdot\dot{1}\dot{4} = 6\tfrac{13}{90}$, $2\cdot7\dot{1}\dot{4} = 2\tfrac{357}{500}$; hence $6\cdot\dot{1}\dot{4} - 2\cdot7\dot{1}\dot{4}$
$= 6\tfrac{13}{90} - 2\tfrac{357}{500} = 6\tfrac{650}{4500} - 2\tfrac{3213}{4500} = 5 + 1\tfrac{650}{4500} - 2\tfrac{3213}{4500}$
$= 5\tfrac{5150}{4500} - 2\tfrac{3213}{4500} = 3\tfrac{1937}{4500}$.

(4)

$7\cdot\dot{9}\dot{1}8\dot{6} = 7\tfrac{3058}{3330}$, $2\cdot3\dot{4}\dot{7} = 2\tfrac{172}{495}$; hence $7\cdot\dot{9}\dot{1}8\dot{6} - 2\cdot3\dot{4}\dot{7}$
$= 7\tfrac{3058}{3330} - 2\tfrac{172}{495} = 7\tfrac{336438}{366630} - 2\tfrac{132738}{366630} = 5\tfrac{203231}{366630}$.

(5)

$$7\cdot\dot{5} = 7\tfrac{5}{9}, \quad 1\cdot2\dot{3} = 1\tfrac{7}{30}, \quad 7\cdot\dot{1}\dot{9}\dot{1} = 7\tfrac{18}{99}.$$

Hence $7\cdot\dot{5} + 1\cdot2\dot{3} + 7\cdot\dot{1}\dot{9}\dot{1} = 7\tfrac{5}{9} + 1\tfrac{7}{30} + 7\tfrac{18}{99} =$
$7 + 1 + 7 + \tfrac{5}{9} \times \tfrac{7}{30} + \tfrac{18}{99} = 15 + \tfrac{550}{990} + \tfrac{231}{990} +$
$\tfrac{180}{990} = 15\tfrac{971}{990}$.

(6)

$\cdot7 = \tfrac{7}{9}$, $\cdot\dot{1}\dot{2} = \tfrac{4}{33}$, $\cdot\dot{6}\dot{7} = \tfrac{67}{99}$; hence $\cdot7 \times \cdot\dot{1}\dot{2} \times \cdot\dot{6}\dot{7}$
$= \tfrac{7}{9} \times \tfrac{4}{33} \times \tfrac{67}{99} = \tfrac{1876}{29403}$.

(7)

$\dot{\cdot}67 = \frac{61}{90}$; $\ddot{\cdot}914 = \frac{905}{990} = \frac{181}{198}$; hence $\dot{\cdot}67 \times \ddot{\cdot}914 = \frac{61}{90} \times \frac{181}{198} = \frac{11041}{17820}$.

(8)

$6\dot{\cdot}71 = 6\frac{32}{45}$, $6\ddot{\cdot}713 = 6\frac{353}{495}$; hence $6\dot{\cdot}71 \times 6\ddot{\cdot}713 = 6\frac{32}{45} \times 6\frac{353}{495} = \frac{302}{45} \times \frac{3323}{495} = \frac{1003646}{22275} = 45\frac{1171}{22275}$.

(9)

$\dot{\cdot}614 = \frac{614}{999}$, $2\ddot{\cdot}766 = 2\frac{383}{330}$; hence $\dot{\cdot}614 \div 2\ddot{\cdot}766 = \frac{614}{999} \div 2\frac{383}{330} = \frac{614}{999} \div \frac{383}{330} = \frac{614}{999} \times \frac{330}{383} = \frac{614}{333} \times \frac{10}{383} = \frac{6140}{127539}$.

(10)

$1\cdot647 = 1\frac{647}{1000}$; $3\ddot{\cdot}521 = 3\frac{86}{165}$; hence $1\cdot647 \div 3\ddot{\cdot}521 = 1\frac{647}{1000} \div 3\frac{86}{165} = \frac{1647}{1000} \div \frac{581}{165} = \frac{1647}{1000} \times \frac{165}{581} = \frac{1647}{200} \times \frac{33}{581} = \frac{54351}{116200}$.

EXERCISE 53.

(1)

2 days 7 hrs.
24)7 hrs.

7)2·2916 days

·327380952 wk.

(2)

7 oz. 4 dwt. 9 grs.
24)9 grs.

20)4·375 dwt.

12)7·21875 oz.

·6015625 lb.

(3)

16 lbs. 7 oz. 3 drs.
16)3 drs.

16)7·1875 oz.

100)16·44921875 lbs.

·16449218 cwt.

(4)

116 days 14 hrs.
24)14 hrs.

365¼)116·583 days

·31918777 year.

(5)

1 rood 17 yds.

1210)17 yds.

4)1·01404959 roods

·25351239 acre.

(6)

3 qrs. 1 na. 1 in.

$2\frac{1}{4}$)1 inch

4)1·444 nails

6)3·3611 qrs.

·56018 F. E.

(7)

16s. $11\frac{1}{4}$d.

4)2 far.

12)11·5 d.

20)16·9583 s.

·8479166

(8)

£9 14s. $8\frac{1}{2}$d. = 4673 half-pence

£77 0s. 9d. = 36978 half-pence

4673 ÷ 36978 = ·12637

(9)

2 days 17 min. = 2897 min.

7 wks. 4 days = 76320 min.

2897 ÷ 76320 = ·0379585.

(10)

3 fur. 17 per. = 4521 half-feet.

2 miles 4 yds. 1 ft. = 21146 half-feet.

4521 ÷ 21146 = ·2137993.

(11)

17 lbs. 4 oz. = 4992 scr.

19 lbs. 7 oz. 5 drs. 1 scr. = 5656 scr.

4992 ÷ 5656 = ·8826025.

(12)

2 roods 27 yds. = 9788 quarter-yards.
29 per. 29 yds. = 3625 quarter-yards.
9788 ÷ 3625 = 2·7001379

EXERCISE 54.

(1)

£·146785
20

2 | ·935700 s.
12

11 | ·228400 d.
4

0 | ·913600 f.

2s. 11d. ·9136 f.

(2)

·71463 week
7

5 | ·00241 days
24

0 | ·05784 hrs.
60

3 | ·47040 min.
60

28 | ·22400 sec.

5 days 3 min. 28·224 sec.

(3)

2 | ·147 lb.
12

1 | ·764 oz.
8

6 | ·112 drs.
3

0 | ·336 scr.
20

6 | ·720 grs.

2 lbs. 1 oz. 6 drs. 6·72 grs.

(4)

·6143 miles
8

4 | ·9144 far.
40

36 | ·5760 per.
5½

3 | ·1680 yds.
3

0 | ·5040 ft.
12

6 | ·0480 in.

4 fur. 36 per. 3 yds. 6·048 in.

(5)

·916147 acre
4
3 | ·664588 rood.
40
26 | ·583520 per.
30¼
17 | ·651480 yd.
9
5 | ·863320 ft.
144
124 | ·318080 inches.

3 roods 26 per. 17 yds. 5 feet 124·31808 in.

(6)

2 | ·14617 Fr. ells.
6
0 | ·87702 qrs.
4
3 | ·50808 na.
2¼
1 | ·14318 in.

2 Fr. ells 3 na. 1·14318 in.

(7)

9 | ·2645 hrs.
60
15 | ·8700 min.
60
52 | ·2000 sec.

9 hrs. 15 min. 52·2 sec.

(8)

4 | ·7177 hhd.
2
1 | ·4354 brl.
31½
13 | ·7151 gal.
4
2 | ·8604 qts.
2
1 | ·7208 pts.

4 hhd. 1 brl. 13 gal. 2 qts. 1·7208 pts.

(9)

3 | ·33625 roods.
40
13 | ·45000 per.
30¼
13 | ·61250 yds.
9
5 | ·51250 ft.
144
73 | ·80000 in.

3 roods 13 per. 13 yds. 5 ft. 73·8 in.

(10)

9 | ·914 pound
20
18 | 280 s.
12
3 | ·360 d.
4
1 | ·440 far.

£9 18s 3½d ·44 far.

(11)

£3 4s 7½d = £3·23125.

£3·23125 × 6·714 = £21·6946125.

£21)·6946125
20
13 | ·8922500 s.
12
10 | ·7070000 d.
4
2 | ·8280000 far.

£21 13s 10½d ·828 far.

(12)

9 | ·1467 years
365¼
53 | ·582175 days
24
13 | ·972200 hrs.
60
58 | ·332000 min.
60
19 | ·92000 sec.

9 years 53 days 13 hrs. 58 min. 19·92 sec.

(13)

$\$2{\cdot}78 \times {\cdot}12345 = \$0{\cdot}343191.$

(14)

27 sq. yds. 2 ft. = 245 ft.

245 sq. ft. × ·65265 = 159·89925 sq. ft.

159·89925 sq. ft. = 17 sq. yds. 6·89925 sq. ft.

144

129·492 sq. in.

17 sq. yds. 6 ft. 129·492 in.

(15)

7 cwt. 2 qr. 17 lbs. = 767 lbs.

767 × 7·46725 = 5727·38075 lbs.

5727·38075 lbs. = 2 tons 17 cwt. 1 qr. 2·38075 lbs.

(16)

£7 7s 7½d = £7·38125.

£7·38125 × 6·4715 = £47·767759375.

£47 | ·767759375

20

15 | ·355187500

12

4 | ·262250000

4

1 | ·049000000

£49 15s 4¼d ·049 far.

Exercise 55.

(1)

£297 × 400 = 118800
4s × 20 = 80
8½d = 34 far. × 5 ÷ 12 = 14⅙

£297 4s 8½d = $1188·94⅙

$1188·94⅙ = $1188·9416

$1188·9416 ÷ ·0005 = $11889416·6 ÷ 5
= $2377883·333

(2)

Assume 22) 9..11..18..15..21..22..42..36..60
Assume 30) 21..18..30
7.. 3

l. c. m. = 22 × 30 × 7 × 3 = 13860

(3)

$78·90 + $427·43 + $209·17 + $80·43 + $17·90
= $813·83.

£183 15s 11¼d = $735·18¾.

$813·83 − $735·18¾ = $78·64¼.

(4)

l. c. m of 2, 7, 11, 5, and 10 = 770.

770 ÷ 2 = 385; 770 ÷ 7 = 110; 770 ÷ 11 = 70;
770 ÷ 5 = 154; 770 ÷ 10 = 77.

$\frac{1}{2} = \frac{1 \times 385}{2 \times 385} = \frac{385}{770}$; $\frac{4}{7} = \frac{4 \times 110}{7 \times 110} = \frac{440}{770}$;

$\frac{3}{11} = \frac{3 \times 70}{11 \times 70} = \frac{210}{770}$; $\frac{2}{5} = \frac{2 \times 154}{5 \times 154} = \frac{308}{770}$;

$\frac{7}{10} = \frac{7 \times 77}{10 \times 77} = \frac{539}{770}$.

(5)

£2 4s 10½d × 6 = £13 9s 1½d

15

£22 8 6½ × 2 = 44 17 1

10

£224 5 5 × 7 = 1569 17 11

Sum = £1628 4 1½

(6)

44 miles ÷ 13 ft. 7 in.

44 miles = 2787840 inches, and 13 ft. 7 in. = 163 in.

2787840 ÷ 163 = 17103 $\frac{51}{163}$ times.

(7)

From \$7498·70 take away \$749·83 and the remainder \$6748·87 = three times the share of B or C.

Hence share of B or C = \$6748·87 ÷ 3 = \$2249·62½,

and share of A = \$2249·62½ + \$749·83 = \$2999·45½.

(8)

\$6880
9775
6750
58877
9105
8750
9880
58712

\$168729

(9)

\$2702
3537
3830
2156
3156
10688
25561

\$49630

From \$168729

Take 51630

Rem. 117099

(10)

$\frac{1}{2} \times \frac{13}{4} \times \frac{36}{7} \times \$28{\cdot}28 = \$236{\cdot}34.$

£6 11s 5½d = $\$26{\cdot}29\frac{1}{6}$.

·7 of 2·4 of 3·7 of $\frac{25}{34}$ of $\$26{\cdot}29\frac{1}{6}$

$$= \frac{7}{10} \times \frac{24}{10} \times \frac{34}{9} \times \frac{25}{34} \times \frac{\$157{\cdot}75}{6} = \frac{\$1104{\cdot}24}{9}$$

$= \$122{\cdot}69\frac{4}{9}$.

$\$236{\cdot}34 - \$122{\cdot}69\frac{4}{9} = \$113{\cdot}64\frac{5}{9}$.

(13)

$$\frac{27 \times 15 \times 64 \times 117 \times 23 \times 115 \times 93 \times 144}{5 \times 729 \times 184 \times 27 \times 12 \times 13}$$

$32 \times 23 \times 31 = 22816.$

(14)

$\frac{1}{2}$ of $\frac{3}{7}$ of $\frac{7}{11}$ of $37\frac{1}{2} = \frac{1}{2} \times \frac{3}{7} \times \frac{7}{11} \times \frac{75}{2} = \frac{225}{44} = 5\frac{5}{44}$.

$2\frac{3}{4} + 5\frac{5}{44} + \frac{3}{8} + 8\frac{1}{2} = 15 + \frac{3}{4} + \frac{5}{44} + \frac{3}{8} + \frac{1}{2}$

$= 15 + \frac{165}{220} + \frac{25}{220} + \frac{132}{220} + \frac{100}{220} = 15 + \frac{432}{220}$

$= 15 + 1\frac{212}{220} = 16\frac{53}{55}$.

$\frac{3}{7} + 4\frac{3}{5} = 4 + \frac{3}{7} + \frac{3}{5} = 4 + \frac{10}{35} + \frac{21}{35} = 4\frac{31}{35}$ to be subtr.

$16\frac{53}{55} - 4\frac{31}{35} = 16\frac{371}{385} - 4\frac{341}{385} = 12\frac{30}{385} = 12\frac{6}{77}$.

(15)

2 days 4 hrs. = 52 hrs. ; 3 wks. 3 days = 576 hrs.

$52 \div 576 = \cdot 0902777.$

(16)

17810)63294(3
53430

9864)17810(1
9864

7946)9864(1
7946

1918)7946(4
7672

274)1918(7
1918

G. C. M. = 274.

(17)

$\cdot 7 = \frac{7}{9}$; $\cdot 93 = \frac{93}{99} = \frac{31}{33}$; $\cdot 00045 = \frac{45}{99999} = \frac{5}{11111}$

$\cdot 27146 = \frac{27146 - 27}{99900} = \frac{27119}{99900}$

(18)

acre.	rood.	per.	yds.
2	1	17	9
4			

9 roods.
40

377 per.
30¼

11319
94¼

11413¼ yds.

11413¼ yds.
9

102719¼ ft.
144

14791572 inches.

(19)

·7149625 miles.
8
5)·7197000 fur.
40
28)·7880000 per.
5½
4)·3340000 yds.
3
1)·0020000 ft.
12
9)·0240000 in.

5 fur. 28 per. 4 yds. 1 ft. 0·024 in.

(20)

·7 per × 5½ = 3·85 yds. + ·625 yds. = 4·475 yds.
4·475 yds. = 4 yds. 1·425 ft; 4 yds. 1·425 ft. + ·713 ft.
= 4 yds. 2·138 ft.
4 yds. 2·138 ft. = 4 yds. 2 ft. 1·646 in.
4 yds. 2 ft. 1·646 in. + ·91 in. = 4 yds. 2 ft. 2·556
or ·7 per. × 5½ × 3 × 12 = 138·6 inches; ·625 yds.
× 3 × 12 = 22·5 in.; ·713 ft. × 12 = 8556 in.

inches.
138·6
22·5
8·556
·91
170·566 = 4 yds. 2 ft. 2·556 ins.

(21)

$\frac{4}{15} = 4 \div 15 = 0{\cdot}2666+$; $\frac{9}{47} = 9 \div 47 = 0{\cdot}1915+$;
$\frac{5}{21} = 5 \div 21 = 0{\cdot}2380+$

Therefore $\frac{4}{15}$ is greatest; and $\frac{9}{47}$ least.

(22)

$3\frac{1}{4}$ Flem. E. = 39 na. and 1 yd. = 16 na. ∴ $3\frac{1}{4}$ Flem. E. is $\frac{32}{16}$ of a yd.

(23)

\$3·73 × 229 = \$854·17 = price of sheep
£11 11s. 7d. × 13 = £150 10s. 7d. = \$602·11⅔ = cost of cows.
\$854·17 — \$602·11⅔ = \$252·05⅓ = money taken home.

(24)

623525 — 20735 = 602790 doz.
\$2487 ÷ 20735 = \$0·119 +; \$66860 ÷ 623525 = \$0·107+

(25)

Assume 24) 6..10..16..20..24..28..32..36..40..44

.. .. 7.. 4.. 3.. 5..11

l. c. m. = 24 × 7 × 4 × 3 × 5 × 11 = 110880

(26)

746 times 193 = 746 × 193 × 143978 and 143978 ÷ 123 = $1170\frac{68}{123}$

Therefore $1170\frac{68}{123}$ times 123 is 746 times 193.

(27)

Dividend = quotient × divisor
= 794 × 83 = 65902

(28)

lbs. oz. drs.

19)749 4 7 (39 lbs 6 oz. $15\frac{7}{19}$ drs.

57

179

171

8

16

132 oz.

114

18

16

295 drs.

19

105

95

10

(29)

346 a. 1 r. 17 per. = 1676364¼ yds.

2 a. 3 r. 27 per. 9 yds. = 14135¾ yds.

$1676364\frac{1}{4} \div 14135\frac{3}{4} = 6705457 \div 56543 = 118{\cdot}904002$

(30)

2 bush. 1 pk. 1 qt. = 73 qts.; 11 bush. 3 pks. = 376 qts.

Therefore 2 bush. 1 pk. 1 qt. = $\frac{73}{376}$ of 11 bush. 3 pk.

(31)

£217 4s. 7¾d. = $\$868{\cdot}92\frac{11}{12}$.

$\$947{\cdot}60 + \$207{\cdot}90 + \$274{\cdot}33 + \$868{\cdot}92\frac{11}{12} = \$2298{\cdot}75\frac{11}{12}$

$\$1298{\cdot}75916 \div 299 = \$7{\cdot}688157.$

(32)

$$\frac{\frac{7}{\cancel{63}}\times\frac{\cancel{47}}{\cancel{141}}\times\frac{\cancel{3}}{\cancel{21}}\times\frac{11}{\cancel{121}}\times\frac{\cancel{3}\,\cancel{33}}{\cancel{264}}\times\frac{\cancel{5}\,\cancel{25}}{\cancel{625}}}{\frac{\cancel{35}}{\cancel{7}}\times\frac{\cancel{81}}{\cancel{9}}\times\frac{\cancel{55}}{\cancel{5}}\times\frac{48}{\cancel{51}}\times\frac{\cancel{17}}{\cancel{47}}\times\frac{\cancel{40}}{\cancel{8}}} = \frac{7\times11\times5}{48} = \frac{385}{48} = 8\tfrac{1}{48}$$

EXERCISE 56.

(5)

9 : 17 = 9 ÷ 17 = ·529 ; 16:33 = 16 ÷ 33 = ·484 = least ; 47:79 = 47 ÷ 79 = ·594 = greatest.

(6)

11:3 = 11 ÷ 3 = 3·666 = greatest ;
17:5 = 17 ÷ 5 = 3·400 ;
38:11 = 38 ÷ 11 = 3·454 ;
164:55 = 164 ÷ 55 = 2·981 = least.

(7)

49:5 = 49 ÷ 5 = 9·800 ;
176:16·4 = 176 ÷ 16·4 = 1760 ÷ 164 = 10·731 ;
267·4:25·9 = 267·4 ÷ 25·9 = 2674 ÷ 259 = 10·324 ;
8:·89 = 8 ÷ ·89 = 800 ÷ 89 = 8·988.
Hence greatest is 176:16·4 and least is 8:·89.

(8)

$$\frac{\cancel{7}}{4}\times\frac{11}{\cancel{22}\,2}\times\frac{\cancel{11}\tfrac{1}{2}}{\cancel{9}}\times\frac{\cancel{9}}{\cancel{1}\tfrac{1}{4}\,2} = \frac{11}{2\times2\times4} = \frac{11}{16} = 11:16$$

(9)

$$\frac{6}{11}\times\frac{12}{17}\times\frac{8\tfrac{1}{4}}{4\tfrac{1}{2}}\times\frac{27}{121}\times\frac{5\tfrac{1}{2}}{6}\times\frac{\cancel{6}}{11}\times\frac{\cancel{12}}{17}\times\frac{\overset{11}{\cancel{33}}}{\cancel{18}\,3}\times\frac{27}{\cancel{121}\,11}$$

$$\times\frac{\cancel{11}}{\cancel{12}} = \frac{27}{17\times11} = \frac{27}{187} = 27:187$$

(10)

$$\frac{\cancel{15}^{5}}{\cancel{4}} \times \frac{\cancel{16}^{\cancel{8}^{2}}}{\cancel{7}} \times \frac{\cancel{9}}{\cancel{20}^{2}} \times \frac{\cancel{70}^{10}}{\cancel{27}^{3}} \times \frac{6}{\cancel{5}} = \frac{2\times 6}{1} = \frac{12}{1} = 12:1$$

(11)

$$\frac{\cancel{8}}{\cancel{7}} \times \frac{6}{5} \times \frac{\cancel{4}}{\cancel{3}} \times \frac{2}{1} \times \frac{\cancel{3}}{\cancel{21}^{\cancel{32}^{4}}} = \frac{6\times 2}{5} = \frac{12}{5} = 12:5$$

(12)

$$\frac{\cancel{2}}{\cancel{3}} \times \frac{4}{5} \times \frac{\cancel{6}^{2}}{7} \times \frac{8}{9} \times \frac{16}{23} = \frac{2\times 4\times 2\times 8\times 16}{5\times 7\times 9\times 2\times 23} = \frac{2048}{7245}$$

$= 2048 : 7245.$

Exercise 57.

(1)

$$\frac{21 \times 40}{7} = 120$$

(2)

$$\frac{7 \times 46}{91} = \frac{46}{13} = 3\tfrac{7}{13}.$$

(3)

$$\frac{3 \times 17}{11} = \frac{51}{11} = 4\tfrac{7}{11}$$

(4)

$$\frac{47 \times 29}{9} = \frac{1363}{9} = 151\tfrac{4}{9}.$$

(5)

$$\frac{23 \times 42}{6} = 23 \times 7 = 161$$

(6)

$$\frac{21\times 18\frac{1}{2}}{111} = \frac{7\times 18\frac{1}{2}}{37} = \frac{7}{2} = 3\tfrac{1}{2}.$$

(7)

$$\frac{10 \times 11}{9} = \frac{110}{9} = 12\tfrac{2}{3}.$$

(8)

$$\frac{14 \times 65}{13} = 14 \times 5 = 70$$

(9)

$$\frac{109 \times 72}{1728} = \frac{109}{24} = 4\ \tfrac{13}{24}.$$

(10)

$$\frac{16 \times 11}{253} = \frac{16}{23}$$

(11)

$$\frac{891 \times 100}{9} = 99 \times 100 = 9900$$

(12)

$$\frac{\$61{\cdot}50 \times 21}{9} = \$20{\cdot}50 \times 7 = \$143{\cdot}50$$

(13)

$$\frac{£16\ 4s.\ 11\tfrac{1}{2}d. \times 147}{11} = £1\ 9s.\ 6\tfrac{1}{2}d. \times 147 = £217\ 2s.\ 7\tfrac{1}{2}d.$$

(14)

$$\frac{\$66{\cdot}87 \times 20}{3} = \$22{\cdot}29 \times 20 = \$445{\cdot}80$$

(15)

$$\frac{16 \times 17}{9} = \frac{272}{9} = 30\tfrac{2}{9} \text{ days.}$$

(16)

$$\frac{11 \times 47}{21} = \frac{517}{21} = 24\tfrac{13}{21} \text{ weeks.}$$

(17)

$$\frac{£6\ 7s.\ 4d. \times 29}{17} = \frac{£184\ 12s.\ 8d.}{17} = £10\ 17s.\ 2\tfrac{10}{17}d.$$

(18)

$$\frac{\$7496{\cdot}40 \times 1}{211} = \frac{\$7496{\cdot}40}{211} = \$35{\cdot}527$$

(19)

$$\frac{\$421{\cdot}40 \times 3}{62} = \frac{\$1264{\cdot}20}{62} = \$20{\cdot}3903$$

(20)

$$\frac{\$56{\cdot}70 \times 23}{7} = \$8{\cdot}10 \times 23 = \$186{\cdot}30$$

Simple Proportion

EXERCISE 58.

(1)

$$28 : 42 :: 27 : \text{Ans.} = \frac{\overset{3}{\cancel{42}} \times 27}{\underset{2}{\cancel{28}}} = \tfrac{81}{2} = 40\tfrac{1}{2} \text{ acres.}$$

(2)

$$13 : 65 :: \$1{\cdot}30 : \text{Ans.} = \frac{\$1{\cdot}30 \times \overset{5}{\cancel{65}}}{\underset{1}{\cancel{13}}} = \$6{\cdot}50$$

(3)

$$125 : 145 :: 100 : \text{Ans.} = \frac{\overset{29}{\cancel{145}} \times \overset{4}{\cancel{100}}}{\underset{5}{\cancel{125}}} = 29 \times 4$$

$$= 116 \text{ men.}$$

(4)

$$6 : 10 :: 100 : \text{Ans.} = \frac{10 \times 100}{6} = \frac{1000}{6} = 166\tfrac{2}{3} \text{ days.}$$

(5)

$$13\tfrac{1}{3} : 4\tfrac{3}{16} :: \$12{\cdot}90 : \text{Ans.} = \$12{\cdot}90 \times 4\tfrac{3}{16} \div 13\tfrac{1}{3}$$

$$= \$12{\cdot}90 \times \tfrac{67}{16} \times \tfrac{3}{40} = \frac{\$12{\cdot}90 \times 67 \times 3}{16 \times 40} = \$4{\cdot}0514$$

(6)

$$80 : 100 :: \$7149 : \text{Ans.} = \frac{\$7149 \times 100}{80}$$

$$= 71\tfrac{49}{8}0 = \$8936{\cdot}25$$

(7)

$$1000 : 16{\cdot}714 :: \$18{\cdot}70 : \text{Ans.} = \frac{\$18{\cdot}70 \times 16714}{1000}$$

$$= \frac{\$312551{\cdot}80}{1000} = \$312{\cdot}5518$$

(8)

$$\$1 : \$7149{\cdot}70 :: 1\tfrac{1}{4} : \text{Ans.} = \frac{1\tfrac{1}{4} \times 7149{\cdot}70}{1}$$

$$= 1\tfrac{1}{4} \times 7149{\cdot}70 = 12511{\cdot}975 \text{ cts.} = \$125{\cdot}11975$$

(9)

$$\tfrac{3}{7} : 1 :: \$7194{\cdot}60 : \text{Ans.} = \frac{\$7194{\cdot}60 \times 1}{\frac{3}{7}}$$

$$= \$7194{\cdot}60 \times \tfrac{7}{3} = \$16787{\cdot}40$$

(10)

$$871 : 127 :: \$8671{\cdot}40 : \text{Ans.} = \frac{\$8671{\cdot}40 \times 127}{871}$$

$$= \$1264{\cdot}3717$$

(11)

$$702 : 540 :: £48\ 2s.\ 4\tfrac{1}{2}d. : \text{Ans.} = \frac{£48\ 2s.\ 4\tfrac{1}{2}d. \times 540}{702} = \frac{£48\ 2s.\ 4\tfrac{1}{2}d. \times 10}{13} = \frac{£481\ 3s.\ 9d.}{13} = £37\ 0s.\ 3\tfrac{6}{13}d.$$

(12)

$$20 : 35 :: 6 : \text{Ans.} = \frac{35 \times 6}{20} = \frac{7 \times 3}{2} = \frac{21}{2} = 10\tfrac{1}{2} \text{ mths.}$$

(13)

£1 : £1749 16s 8¾d :: 3s 4d : Ans.

$$= \frac{£1749\ 16\ 8\tfrac{3}{4} \times 40}{240} = \frac{£1749\ 16\ 8\tfrac{3}{4}}{6} = £291\ 12s.\ 9\tfrac{11}{24}d.$$

(14)

24 a. 1r. 17 per. : 7 a. 1 per. 9 yds. :: $763·80 : Ans.

or 471537 qr. yds. : 135677 qr. yds. :: $763·80 : Ans.

$$= \frac{\$763·80 \times 135677}{471537} = \frac{\$103630092·60}{471537} = \$219·77$$

(15)

$$100 : 63 :: \$3·75 : \text{Ans.} = \frac{\$3·75 \times 63}{100} = \$$$

(16)

$$7 : 276 :: \$7{\cdot}90 : \text{Ans.} = \frac{\$7{\cdot}90 \times 276}{7} = \$311{\cdot}48\tfrac{4}{7}$$

(17)

$\$71911{\cdot}40 : \$1 :: \$53069{\cdot}80 : \text{Ans.}$

$$= \frac{\$53069{\cdot}80 \times 1}{71911{\cdot}40} = \$0{\cdot}7379$$

(18)

17 a. 1r. 36 per : 247 a. 1r. 27 per :: £111 17s. 8d. : Ans.

or 2796 per : 39587 per :: £111 17s. 8d. : Ans.

$$= \frac{\text{£111 17s. 8d.} \times 39587}{2796} = \frac{\text{£4429125 10s. 4d.}}{2796}$$

$$= \text{£1584 1s. } 10\tfrac{313}{699}\text{d.}$$

(19)

$$16 : 27 :: \$97{\cdot}80 : \text{Ans.} = \frac{\$97{\cdot}80 \times 27}{16} = \frac{\$24{\cdot}45 \times 27}{4}$$

$$= \$165{\cdot}0375$$

(20)

$$8 : 291 :: 7 : \text{Ans.} = \frac{291 \times 7}{8} = 254\tfrac{1}{8}$$

(21)

3 cwt. 2 qrs. 26 lbs. : 71 cwt. 1 qr. 17 lbs. :: \$21·60

: Ans. or 418 lbs. : 7997 lbs. :: \$21·60 : Ans.

$$= \frac{\$21{\cdot}60 \times 7997}{418} = \frac{\$172735{\cdot}20}{418} = \$413{\cdot}2421$$

(22)

$3\frac{3}{4} : 7\frac{3}{5} :: \$2{\cdot}21 : \text{Ans.} = \$2{\cdot}21 \times 7\frac{3}{5} \div 3\frac{3}{4}$

$= \$2{\cdot}21 \times \frac{38}{5} \times \frac{4}{15}$

$= \frac{\$2{\cdot}21 \times 38 \times 4}{5 \times 15} = \frac{\$335{\cdot}92}{75} = \$4{\cdot}4789$

(23)

$8000 : 15000 :: 5 : \text{Ans.} = \frac{5 \times 15000}{8000} = \frac{75}{8} = 9\frac{3}{8}$ wks.

(24)

$5 : 129 :: 7 : \text{Ans.} = \frac{129 \times 7}{5} = \frac{903}{5} = 180$ ft. $7\frac{1}{5}$ in.

(25)

$4 : 27 :: 149 : \text{Ans.} = \frac{149 \times 27}{4} = \frac{4023}{4}$

$= 1005$ miles 6 fur.

(26)

$5 : 729 :: 4 : \text{Ans.} = \frac{729 \times 4}{5} = 583\frac{1}{5}$ yds.

(27)

$6 : 29 :: 11 : \text{Ans.} = \frac{29 \times 11}{6} = \frac{319}{6} = 53\frac{1}{6}$

(28)

1 lb. : 174 lbs. :: 29 : Ans. $= \frac{174 \times 29}{1}$

$= 5046$ cents $= \$50{\cdot}46$

(29)

$\$4{\cdot}75 : \$3{\cdot}60 :: 243 \text{ acres} : \text{Ans.}$

$$= \frac{243 \times 360}{475} = \frac{87480 \text{ a.}}{475} = 184 \text{ a. } 0 \text{r. } 26\tfrac{18}{19} \text{ per.}$$

(30)

$$4\tfrac{3}{7} : 27\tfrac{4}{5} :: £\tfrac{19}{21} : \text{Ans.} = £\tfrac{19}{21} \times 27\tfrac{4}{5} \div 4\tfrac{3}{7}$$

$$= £\tfrac{19}{21} \times \tfrac{139}{5} \times \tfrac{7}{31}$$

$$= \frac{£19 \times 139}{3 \times 5 \times 31} = \frac{£2641}{465} = £5\ 13\text{s. } 7\tfrac{3}{31}\text{d.}$$

(31)

$$\$67\tfrac{4}{11} : \$23\tfrac{9}{13} :: 6\tfrac{1}{4} \text{ a.} : \text{Ans.} = 6\tfrac{1}{4} \times 23\tfrac{9}{13} \div 67\tfrac{4}{11}$$

$$= \frac{25}{4} \times \frac{308}{13} \times \frac{11}{741} = \frac{21175 \text{ a.}}{9633} = 2 \text{ a. } 0 \text{r. } 31\tfrac{6817}{9633} \text{ per.}$$

(32)

$4{\cdot}32 : 9{\cdot}78 :: \$1{\cdot}17 : \text{Ans.}$

$$= \frac{\$1{\cdot}17 \times 9{\cdot}78}{4{\cdot}32} = \frac{\$11{\cdot}4426}{4{\cdot}32} \ \$2{\cdot}648$$

(33)

$$19{\cdot}87 : 9\tfrac{3}{7} :: \$17\tfrac{1}{3} : \text{Ans.} = \$17\tfrac{1}{3} \times 9\tfrac{3}{7} \div 19{\cdot}87$$

$$= \tfrac{157}{9} \times \tfrac{66}{7} \div \tfrac{1987}{100}$$

$$= \frac{\$157}{9} \times \frac{66}{7} \times \frac{100}{1987} = \frac{\$1036200}{125181} = \$8{\cdot}2776$$

(34)

$11 : 27 :: 29 \text{ lbs.} : \text{Ans.}$

$$= \frac{29 \text{ lbs.} \times 27}{11} = \frac{783}{11} = 71\tfrac{2}{11} \text{ lbs.}$$

(35)

$$200 : 900 :: 2 \text{ days} : \text{Ans.} = \frac{900 \times 2}{200} = \frac{18}{2} = 9 \text{ dys.}$$

(36)

$$\$95\tfrac{7}{11} : \$100 :: \$100 \text{ stock} : \text{Ans.} = \frac{\$100 \times 100}{95\frac{7}{11}}$$

$$= \$100 \times 100 \times \tfrac{11}{1082} = \tfrac{110000}{1082} = \$104{\cdot}5627.$$

(37)

11oz. 11dwt. 11grs. : 16 lbs. 4 oz. 2 dwt. :: \$47·90 : Ans.
or 5555 grs. : 94128 grs. :: \$47·90 : Ans.

$$= \frac{\$47{\cdot}90 \times 94128}{5555} = \frac{\$4508731{\cdot}20}{5555} = \$811{\cdot}652.$$

(38)

73 a. 14 per. : 33 a. 1 r. 23 per. :: £17 4s. 9d. : Ans.
or 11694 per. : 5343 :: £17 4s 9d : Ans.

$$= \frac{\text{£17 4s 9d} \times 5343}{11694} = \frac{\text{£92099 19s 3d}}{11694}$$

$$= \text{£7 17s } 6\tfrac{777}{3898}\text{d.}$$

(39)

$$\tfrac{1}{2} \text{ of } \tfrac{3}{7} \text{ of } \tfrac{4}{5} \text{ of } 17\tfrac{1}{2} \text{ lbs.} = \frac{1}{\cancel{2}} \times \frac{3}{7} \times \frac{\cancel{4}^{2}}{5} \times \frac{\cancel{35}^{5}}{\cancel{2}} = 3 \text{ lbs.}$$

$$\tfrac{2}{7} \text{ of } \tfrac{3}{11} \text{ of } \$38{\cdot}50 = \frac{\$38{\cdot}50}{1} \times \frac{2}{7} \times \frac{3}{11}$$

(Continued on next page.)

(39 continued.)

$$= \frac{\$0{\cdot}50 \times 2 \times 3}{1} = \$3.$$

$$6\tfrac{3}{4} \text{ of } \tfrac{1}{5} \text{ of } \tfrac{2}{7} \text{ of } 8\tfrac{1}{2} \text{ lbs.} = \frac{27}{4} \times \frac{1}{5} \times \frac{2}{7} \times \frac{17}{2} = \tfrac{51}{28} \text{ lbs.}$$

$$3 : \tfrac{51}{28} :: \$3{\cdot}00 : \text{Ans.} = \$3{\cdot}00 \times \tfrac{51}{28} \div \tfrac{3}{1}$$

$$= \frac{\$1{\cdot}00}{1} \times \frac{51}{28} \times \frac{1}{3} = \frac{\$51{\cdot}00}{28} = \$1{\cdot}8214.$$

(40)

$$29 : 107 :: 11 : \text{Ans.} = \frac{107 \times 11}{29} = \frac{1177}{29} = 40\tfrac{17}{29}.$$

EXERCISE 59.

(1)

$$\left.\begin{matrix} 24 : 17 \\ 12 : 22 \end{matrix}\right| :: 7 : \text{Ans.} = \frac{7 \times 17 \times 11}{24 \times 12} = \tfrac{1309}{144} = 9\tfrac{13}{144} \text{ ac.}$$

(2)

$$\left.\begin{matrix} 11 : 7 \\ 7 : 16 \end{matrix}\right| :: \$490 : \text{Ans.} = \frac{\$490 \times 7 \times 16}{7 \times 11} = \$712{\cdot}72\tfrac{8}{11}.$$

(3)

$$\left.\begin{matrix}5000 : 4000 \\ 15 : 11\end{matrix}\right| :: 110 \text{ reams} : \text{Ans.} = \frac{\overset{22}{\cancel{110}} \times \cancel{4000} \times 11}{\cancel{5000} \times 15}$$

$$= \tfrac{968}{15} = 64\tfrac{8}{15}.$$

(4)

$$\left.\begin{matrix}7 : 21 \\ 93 \text{ a.} : 16 \text{ a. } 3 \text{ r. } 20 \text{ per.}\end{matrix}\right| :: 5 : \text{Ans.} = \frac{\overset{3}{\cancel{5}} \times \cancel{21} \times \overset{135}{\cancel{2700}}}{\cancel{7} \times \cancel{14880}\ \cancel{4960}\ 248}$$

$$= \tfrac{675}{248} = 2\tfrac{179}{248} \text{ days.}$$

(5)

$$\left.\begin{matrix}24 : 50 \\ 8 : 11\end{matrix}\right| :: 7 \text{ days} : \text{Ans.} = \frac{7 \times 50 \times 11}{24 \times 8} = \tfrac{3850}{192}$$

$$= 20\tfrac{5}{96} \text{ days.}$$

(6)

$$\left.\begin{matrix}750 : 467 \\ 23 : 7\end{matrix}\right| :: \$204 : \text{Ans.} = \frac{\$204 \times 467 \times 7}{750 \times 23}$$

$$= \$38{\cdot}65\tfrac{109}{115}.$$

(7)

$$\left.\begin{matrix}17 : 34 \\ 11 : 33 \\ 5 : 4 \\ 3 : 2\end{matrix}\right| :: 79 : \text{Ans.} = \frac{79 \times \overset{2}{\cancel{34}} \times \overset{3}{\cancel{33}} \times 4 \times 2}{17 \times 11 \times 5 \times \cancel{3}}$$

$$= \frac{79 \times 2 \times 2 \times 4}{5} = \tfrac{1264}{5} = 252\tfrac{4}{5} \text{ ft.}$$

(8)

$$\begin{array}{l|l} 34 \text{ a.} : 95 \text{ a. } 32 \text{ per.} & :: 3 : \text{Ans.} = \dfrac{3 \times 15232 \times 5}{5440 \times 6} \\ 6 : 5 & \qquad\qquad 1088 \quad 2 \end{array}$$

$$= \tfrac{15232}{2176} = 7 \text{ men.}$$

(9)

$$\begin{array}{l|l} 36 : 864 & \\ 8 : 6 & \\ 4 : 3 & :: 4 : \text{Ans.} = \dfrac{\overset{3}{\cancel{144}} \qquad\qquad \overset{4}{\cancel{32}}}{\underset{6}{\cancel{36}} \times \cancel{8} \times \cancel{4} \times \cancel{48}} \\ 48 : 32 & \end{array}$$

$$= 4 \times 3 \times 3 = 36 \text{ days}$$

(10)

$$\begin{array}{l|l} 34 : 8 & \\ 6 : 36 & :: 90 : \text{Ans.} = \dfrac{\overset{10}{\cancel{90}} \times 8 \times 36 \times \overset{2}{\cancel{12}}}{\underset{17}{\cancel{34}} \times \cancel{6} \times 9} \\ 9 : 12 & \end{array}$$

$$= \tfrac{2880}{17} = 169\tfrac{7}{17} \text{ cords.}$$

(11)

$$\begin{array}{l|l} 9 : 5 & \\ 10 : 11 & \\ 25 : 36 & :: 16 : \text{Ans.} = \dfrac{\overset{8}{\cancel{16}} \times 5 \times 11 \times \overset{12}{\cancel{36}} \times \overset{2}{\cancel{16}} \times \overset{5}{\cancel{50}} \times \overset{9}{\cancel{45}}}{9 \times 10 \times \underset{5}{\cancel{25}} \times \underset{3}{\cancel{24}} \times \underset{2}{\cancel{44}} \times \underset{8}{\cancel{40}}} \\ 24 : 16 & \\ 44 : 50 & \\ 40 : 45 & \end{array}$$

$$= 12 \text{ days.}$$

(12)

24	:	248
9	:	11
7	:	4
$232\frac{1}{2}$	:	$337\frac{1}{2}$
$3\frac{3}{5}$	:	$5\frac{3}{8}$
$2\frac{1}{3}$	:	$3\frac{1}{2}$

$$:: 5\tfrac{1}{2} \text{ days} : \textit{Ans.} = \frac{5\frac{1}{2} \times 248 \times 11 \times 4 \times 337\frac{1}{2} \times 5\frac{3}{8} \times 3\frac{1}{2}}{24 \times 9 \times 7 \times 232\frac{1}{2} \times 3\frac{3}{5} \times 2\frac{1}{3}} =$$

$$\frac{11}{2} \times \frac{248}{1} \times \frac{11}{1} \times \frac{4}{1} \times \frac{675}{2} \times \frac{28}{5} \times \frac{7}{2} \div \left(\frac{24}{1} \times \frac{9}{1} \times \frac{7}{1} \times \frac{465}{2} \times \frac{11}{3} \times \frac{7}{2} \right) =$$

$$\frac{11}{2} \times \frac{\cancel{248}^{31}}{1} \times \frac{11}{1} \times \frac{4}{1} \times \frac{\cancel{675}^{135}}{\cancel{2}^{1}} \times \frac{\cancel{28}^{7}}{\cancel{5}^{1}} \times \frac{\cancel{7}^{1}}{\cancel{2}^{1}} \times \frac{1}{\cancel{24}^{3}} \times \frac{1}{\cancel{9}^{3}} \times \frac{1}{\cancel{7}^{1}} \times \frac{\cancel{2}^{1}}{\cancel{465}^{31}} \times \frac{\cancel{3}^{1}}{11} \times \frac{\cancel{8}^{1}}{\cancel{7}^{1}} = 11 \times 4 \times 3 = 132 \text{ days.}$$

(13)

500	:	550
36	:	68
40	:	90
44	:	24
9	:	8

$$:: 60 : \textit{Ans.} = \frac{\cancel{550}^{11} \times \cancel{68}^{17} \times \cancel{90}^{9} \times \cancel{24}^{3} \times 8}{\cancel{500}^{10} \times \cancel{36}^{9} \times \cancel{40}^{4} \times \cancel{44}^{4} \times \cancel{9}^{1}} \times \frac{\cancel{8}^{2}}{\cancel{24}^{3}} \times \frac{\cancel{2}^{1}}{\cancel{8}^{1}} = 17 \times 8 = 136 \text{ men.}$$

(14)

9 lbs. 6 oz. 4 dwt : 11 lbs. 11 oz. 17 grs. | : : 60 : *Ans.*
7s. 8½d. : 11s. 4½d. |

$$= \frac{\overset{\overset{3}{12}}{\cancel{60}} \times 68657 \times \overset{91}{\cancel{273}}}{\underset{\underset{4568}{18272}}{\cancel{54816}} \times \underset{37}{\cancel{185}}} = \frac{3 \times 68657 \times 91}{4568 \times 37} = \frac{18743361}{169016}$$

$$= 110\tfrac{151601}{169016} \text{ forks.}$$

NOTE.—9 lbs., 6 oz., 4 dwt., = 54816 grs.; 11 lbs., 11 oz., 17 grs. = 68657 grs. 7s. 8½d. = 185 half-pence; and 11s. 4½d. = 273 half-pence.

(15)

4 : 27 | : : 279 : *Ans.*
60 : 200 |

$$= \frac{279 \times \overset{9}{\cancel{27}} \times \overset{10}{\cancel{200}}}{\underset{3}{\cancel{60}} \times 4}$$

$$= \frac{25110}{4} = 6277\tfrac{1}{2} \text{ bush.}$$

(16)

23 : 48 |
27·9 : 16·5 | : : 7·3 ac's : *Ans.*
11·4 : 9·4 |

$$= \frac{7{\cdot}3 \times \overset{16}{\cancel{48}} \times \overset{5{\cdot}5}{\cancel{16{\cdot}5}} \times 9{\cdot}4}{23 \times \underset{9{\cdot}3}{\cancel{27{\cdot}9}} \times \underset{3{\cdot}8}{\cancel{11{\cdot}4}}}$$

$$= \frac{6038{\cdot}56}{812{\cdot}82} = 7\tfrac{17441}{40641} \text{ acres.}$$

(17)

$$\left.\begin{matrix}11 : 16\\11 : 16\end{matrix}\right| :: \$111\cdot11 : Ans. = \frac{\$111\cdot11 \times 16 \times 16}{11 \times 11}$$

$$= \frac{\$28444\cdot16}{121} = \$235\cdot07\frac{69}{121}.$$

(18)

$$\left.\begin{matrix}8 : 6\\4 : 6\\2 : 4\end{matrix}\right| :: 8550 : Ans. = \frac{8550 \times \overset{3}{6} \times \overset{3}{6} \times \overset{1}{4}}{\underset{2}{8} \times 4 \times \underset{1}{2}}$$

$$= \frac{76950}{4} = 19237\frac{1}{2} \text{ lbs.}$$

(19)

$$\left.\begin{matrix}8 : 10\\8 : 8\\2\frac{1}{2} : 2\end{matrix}\right| :: 10000 : Ans = \frac{10000 \times \overset{2\frac{1}{2}}{10} \times \overset{1}{8} \times \overset{1}{2}}{\underset{4}{8} \times 8 \times \underset{1}{2\frac{1}{2}}}$$

$$= 10000 \text{ lbs.}$$

(20)

$$\left.\begin{matrix}2\frac{1}{4} : 17\frac{3}{5}\\1\frac{2}{3} : 1\frac{3}{7}\end{matrix}\right| :: 14 \text{ oz.} : Ans. = \frac{14 \times 17\frac{3}{5} \times 1\frac{3}{7}}{1\frac{2}{3} \times 2\frac{1}{4}}$$

$$= \frac{14}{1} \times \frac{88}{5} \times \frac{10}{7} \div \left(\frac{5}{3} \times \frac{9}{4}\right)$$

$$= \frac{\overset{2}{14}}{1} \times \frac{88}{5} \times \frac{\overset{2}{10}}{\underset{1}{7}} \times \frac{\overset{1}{3}}{\underset{1}{5}} \times \frac{4}{\underset{3}{9}} = \frac{1408}{15} = 93\frac{13}{15} \text{ oz.}$$

(21)

$$\left.\begin{matrix} 2\frac{1}{3} : 1\frac{3}{5} \\ 847 : 981 \end{matrix}\right| :: 2043\tfrac{3}{7} \text{ yds.} : \textit{Ans.} = \frac{2043\frac{3}{7} \times 1\frac{3}{5} \times 981}{2\frac{1}{3} \times 847}$$

$$= \frac{14304}{7} \times \frac{8}{5} \times \frac{981}{1} \div \left(\frac{7}{3} \times \frac{847}{1}\right)$$

$$= \frac{14304}{7} \times \frac{8}{5} = \frac{981}{1} \times \frac{3}{7} \times \frac{1}{847} = \frac{336773376}{207515}$$

$$= 1622\tfrac{181946}{207515} \text{ yds.}$$

(22)

$$\left.\begin{matrix} 8 : 14 \\ 4 : 3\frac{1}{2} \\ 7\frac{2}{3} : 9\frac{2}{5} \end{matrix}\right| :: 97 : \textit{Ans.} = \frac{97 \times 14 \times 3\frac{1}{2} \times 9\frac{2}{5}}{8 \times 4 \times 7\frac{2}{3}}$$

$$= \frac{97}{1} \times \frac{14}{1} \times \frac{7}{2} \times \frac{47}{5} \div \left(\frac{8}{1} \times \frac{4}{1} \times \frac{23}{3}\right)$$

$$= \frac{97}{1} \times \frac{14}{1} \times \frac{7}{2} \times \frac{47}{5} \times \frac{1}{8} \times \frac{1}{4} \times \frac{3}{23} = \frac{670173}{3680}$$

$$= 182\tfrac{413}{3680} \text{ acres.}$$

(23)

$$\left.\begin{matrix} 4 : 12 \\ 24 : 97 \end{matrix}\right| :: 450 : \textit{Ans.} = \frac{450 \times 12 \times 97}{4 \times 24} = \frac{\$43650}{8}$$

$$= \$5456{\cdot}25$$

(24)

$$\left.\begin{matrix} 24 : 29 \\ 9 : 27 \end{matrix}\right| :: 54 : \textit{Ans.} = \frac{27 \times 29 \times 27}{24 \times 9} = \frac{783}{4}$$

$$= 195\tfrac{3}{4} \text{ bush.}$$

Practice

Exercise 60.

(1)

50 c.	½	229 at $2·75
		2
		458
25 c.	½	114·50
		57·25
		$629·75

(2)

50 c.	½	743 at $3·81
		3
		2229
25 c.	½	371·50
5 c.	⅒	185·75
1 c.	⅕	37·15
		7·43
		$2830·83

(3)

50 c.	½	7114 at $97.36½
		97
		49798
		64026
		690058
		3557
25 c.	½	1778·50
10 c.	⅖	711·40
1¼ c.	⅛	88·925
¼ c.	⅕	17·785
		$696211·61

(4)

10s.	½	213 at £2 16s 4d
		2
		426
		106 10
5s.	½	53 5
1s 3d	¼	13 6 3
1d.	1/20	17 9
		599 19 0

(5)

1s.	$\frac{1}{20}$	321 at £9 1s. 1¼d.
		9
		2889
1d.	$\frac{1}{12}$	16 1
¼	¼	1 6 9
		6 8¼
		£2906 14 5¼

(6)

10s.	½	7147 at £12 12 2¾
		12
		85764
2s.	$\frac{1}{10}$	3573 10
2d.	$\frac{1}{12}$	714 14
½	¼	59 11 2
¼	½	14 17 9½
		7 8 10¾
		£90134 1 10¼

(7)

50 c.	½	217¾	at 914·70
20 c.	$\frac{1}{5}$	914	3
		868	4)2744·10
		217	
		1953	686·025
		198338	
		108·50	
		43·40	
		686·025	
		$199175·925	

(8)

50 c.	$\frac{1}{2}$	$618\frac{4}{9}$	at $42·71\frac{3}{4}$
20 c.	$\frac{1}{5}$	42	4
		1236	9)170·87
		2472	18·98$\frac{20}{36}$
		25956	
		309	
1	$\frac{1}{20}$	123·60	
$\frac{1}{2}$	$\frac{1}{2}$	6·18	
$\frac{1}{4}$	$\frac{1}{2}$	3·09	
		1·54$\frac{1}{2}$	
		18·98$\frac{5}{9}$	
		$26418·40\frac{1}{18}$	

(9)

50 c.	$\frac{1}{2}$	$907\frac{11}{12}$	at $16·93
		16	11
		5442	12)186·23
		907	15·51$\frac{11}{12}$
		14512	
25	$\frac{1}{2}$	453·50	
12$\frac{1}{2}$	$\frac{1}{2}$	226·75	
5	$\frac{2}{5}$	113·37$\frac{1}{2}$	
$\frac{1}{2}$	$\frac{1}{10}$	45·35	
		4·53$\frac{1}{2}$	
		15·51$\frac{11}{12}$	
		$15371·02\frac{11}{12}$	

(10)

5	½	204½ at £2 7 8½
		2
		408
2s 6d	½	51
2d	1/10	25 10
½d	¼	1 14
		8 6
		1 3 10¼
		£487 16 4½

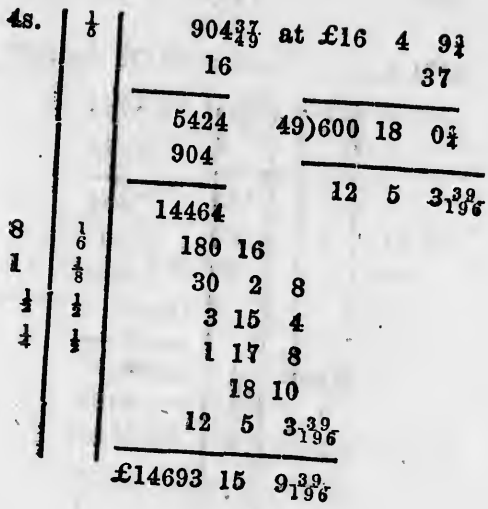
2)2 7 8½

1 3 10¼

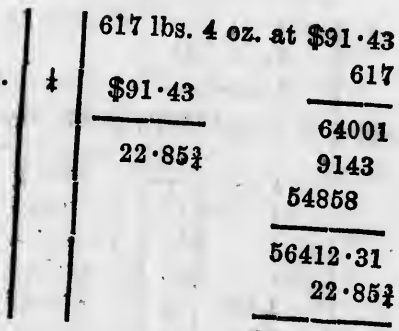
(11)

10	½	604⅜ at £93 13 7
		93 3
		1812 7)281 0 9
		5436
		40 2 11⅛
		56172
3 4	⅓	302
2	1/20	100 13 4
1	⅛	5 0 8
		2 10 4
		40 2 11⅛
		£56622 7 3⅛

(12)



(13)



NOTE.—Most of these questions are more expeditiously worked by mere multiplication; but in order to afford sufficient practice in the rule it is advisable to work as above.

(14)

2171 a. 2 r. 17 per. at $9·70 per acre.

2 r.	$\frac{1}{2}$	9·70
		2171
		970
		6790
		970
		1940
10 per.	$\frac{1}{5}$	21058·70
5	$\frac{1}{2}$	4·85
2	$\frac{2}{5}$	·60$\frac{5}{8}$
		·30$\frac{5}{16}$
		·12$\frac{1}{8}$.
		$21064·58$\frac{1}{16}$

(15)

114 bush. 1 pk. 1 gal. 1 qt. at 37½ cents per bush.

1 pk.	$\frac{1}{4}$	37½
		114
		42·75
1 gal.	$\frac{1}{4}$	·09$\frac{3}{8}$
1 qt.	$\frac{1}{4}$	·04$\frac{11}{16}$
		·01$\frac{11}{64}$
		42·90$\frac{15}{64}$

(16)

209 lbs. 7 dwt. 16 grs. at $1·71 per oz.

12

2508 oz.

5 dwt.	¼	$1·71
		2508
		4288·68
2 dwt. 12 grs.	⅛	·42¾
4 grs.	1/16	·21⅜
		·01 61/120
		$4289·33 11/20

(17)

614 yds. 2 qrs. 1 nail at $2·73 per yd.

2 qrs.	½	2·73
		614
		1676·22
1 na.	⅛	1·36½
		·17 1/16
		$1677·75 9/16

(18)

16 a. 1 r. 4 per. 7 yds. at £2 17s 6d per acre.

12	¼	£2	17	6
				16
4 per.	1/10	46	0	0
7 yds.	7/121		14	4½
			1	5¼
				483/484
		£46	15	10 181/242

(19)

29 wks. 4 days 11 hours at $7·40 per week.

3½ days	½	$7·40
		29
½ day	⅐	214·60
6 hrs.	¼	3·70
3 hrs.	½	·52$\frac{6}{7}$
1½ hrs.	½	·26$\frac{3}{7}$
½ hr.	⅓	·13$\frac{3}{14}$
		·06$\frac{17}{28}$
		·02$\frac{17}{84}$
		$219·31$\frac{13}{42}$

(20)

167 miles 7 fur. 6 per. at £9 3s 6d per mile.

4 fur.	½	£9 3s 6d
		167
2 fur.	½	£1532 4 6
1 fur.	¼	4 11 9
5 per.	⅛	2 5 10½
1 per.	⅕	1 2 11$\frac{1}{2}$
		2 10$\frac{3}{32}$
		6$\frac{141}{160}$
		£1540 8 6$\frac{3}{80}$

(21)

217 lbs. 4 oz. 6 drs. 2 scr. at £9 6s 1d per oz.

12

2608 oz.

(Continued on next page.)

(21) continued.

4 drs.	½	£9 6s 7d
		2608
2 drs.	½	24330 9 4
1½ scr.	½	4 13 3½
½ scr.	⅓	2 6 7¾
		11 7 15/16
		3 10 31/48
		£24338 4 9 5/6

(22)

2s. 6d.	⅛	9167 at £1 3s. 6d. each.
1	1/20	1145 17 6
		458 7
		£10771 4 6

(23)

40 c.		21791 at $1·40 each.
		716·40
		$30507·40

(24)

2s.	1/10	1673 3/11 sq. yds. at 2s. 3½d per sq. yard.
		3
3d.	⅛	167 6 — 11)6 10½
		20 18 3
½d.	1/6	3 9 8½ — 7½
		7½
		£191 14 7

(25)

437 a. 9 per. 7 yds. at $21·40 per acre.

8 per.	$\frac{1}{10}$	$21·40
		437
		$9351·80
1 per.	$\frac{1}{8}$	1·07
7 yds.	$\frac{28}{121}$	·13$\frac{3}{8}$
		·03$\frac{23}{242}$
		$9353·03$\frac{155}{968}$

(26)

97 cub. yd. 4 ft. at $0·73 per cub. yd.

3 ft.	$\frac{1}{9}$	$0·73
		97
		$70·81
1 ft.	$\frac{1}{3}$	·08$\frac{1}{9}$
		·02$\frac{19}{27}$
		$70·91$\frac{23}{27}$

(27)

20	$\frac{1}{8}$	614$\frac{3}{5}$ cwt. at $1·23 per cwt.	
2	$\frac{1}{10}$	122·80	3
1	$\frac{1}{2}$	12·28	
		6·14	19)3·69
		·19$\frac{8}{19}$	
		$755·41$\frac{8}{19}$	·19$\frac{8}{19}$

(28)

23 lbs. 4 oz. 7 dwt. 11 grs. at 11¼d per dwt.

12

286

20

5607 dwt. 11 grs. at 11¼d per dwt.

6	½					
3	½	2803	6	8 grs.	⅓	11¼d.
2	⅓	1401	9			
1	¼	934	6	2 grs.	¼	3 11/12
¼	½	233	7½	1 gr.	½	0 47/48
		116	9¾			0 47/96
			5 37/96			5 37/96

20)5490 7 61/96

£274 10s. 7 61/96d.

(29)

216 cwt. 2 qrs. 19 lbs. at $96·71 per cwt.

		$96·71
		216
		20889·36
2 qrs.	½	48·35½
14 lbs.	¼	12·08⅞
3½ lbs.	¼	3·02 7/32
1½ lbs.	⅜	1·29 117/224
		$20954·12 13/112

(30)

179 cwt. 1 qr. 23 lbs. at £9 14s. 11½d. per cwt.

1 qr.	¼	£9 14s. 11½d.
		179
		1744 17 6 ½
14 lbs.	½	2 8 8 7/8
7 lbs.	¼	1 4 4 7/16
		12 2 7/32
2 lbs.	2/7	3 5 174/224
		£1749 6 3 181/224

EXERCISE 62.

(1)

$6090·80 × ·27 = $1644·516

(2)

$1234 × ·875 = $1079·750

(3)

$89·40 × ·0625 = $5·5875

(4)

$2998·40 × ·175 = $524·72

(5)

204a. 2r. 14 per. = 204·5875a.; 204·5875a. × ·085
= 17·3899375 acres
17·3899375 acres = 17 acres, 1 rood, 22 p. 11 yds.
7 ft. 25 14/25 in.

(6)

29 bush. 2 pks. = 29·5 bush.; 29·5 bush. × ·007
= ·2065 bush.
·2065 bush. = 1 gal. 2 qts. 1·216 pts.
= 1 gal. 2 qt. 1 27/125 pts.

(7)

429 lbs. 11 oz. 6 dwt. = 429·9416 lbs.; 429·9416 × ·0072
= 3·09558 lbs.

3·09558 lbs. = 3 lbs. 1 oz. 2 dwt. $22\frac{338}{625}$ grs.

(8)

227 wks. 4 dys. 11 hrs. = 227·6369 + weeks
227·6369 weeks × ·15
= 34·145535 wks. = 34 wks. 1 day 26·99 + minutes.

(9)

£93 14s. 7½d. = £93·73125 ;
£93·73125 × ·06 = £5·623875 = £5 12s. $5\frac{73}{100}$d.

(10)

$2947·40 × ·29 = $854·746.

(11)

$294 × ·16 = $47·04 ; $39·17 × ·29 = $11·3593
$47·04 — $11·3593 = $35·6807

(12)

$94·80 × ·07 = $6·6360 ; $1129 × ·11 = $124·19 ;
$1296·42 × ·175 = $226·8735
$6·636 + $124·19 + $226·8735 = $357·6995

(13)

$7429 × ·15 = $1114·35 = 1st payment.
$7429 × ·17 = $1262·93 = payment at end of 6 months
$7429 × ·29 = $2154·41 = " " 15 "
$7429 × ·09 = $ 668·61 = " " 20 "
$7429 × ·30 = $2228·70 = " " 24 "

(14)

227 × ·20 = 45·4 acres wheat
227 × ·18 = 40·86 " grass
227 × ·17 = 38·59 " peas
227 × ·19 = 43·13 " oats
227 × ·08 = 18·16 " root crops
227 × ·18 = 40·86 " fallow

(15)

$1147 \times \cdot 23 = 263 \cdot 81 = 263\frac{81}{100}$ killed or wounded.
$1147 \times \cdot 07 = 80 \cdot 29 = 80\frac{29}{100}$ taken prisoners.

EXERCISE 63.

(1)

$\$79 \cdot 80 \times \cdot 045 = \$3 \cdot 591.$

(2)

$\$916 \cdot 80 \times \cdot 0775 = \$71 \cdot 052.$

(3)

$\$10800 \times \cdot 015 = \$162.$

(4)

$\$8877 \cdot 66 \times \cdot 0325 = \$288 \cdot 52395.$

(5)

$\$678 \cdot 90 \times \cdot 05 = \$33 \cdot 94\frac{1}{2}.$

(6)

$\$6719 \cdot 50 \times \cdot 0875 = \$587 \cdot 95625.$

(7)

$\$47 \cdot 80 \times \cdot 25 = \$11 \cdot 95.$

(8)

$\$7654 \cdot 32 \times \cdot 045 = \$344 \cdot 4444.$

(9)

$\$234 \cdot 56 \times \cdot 28 = \$65 \cdot 6768.$

(10)

$\$555 \cdot 55 \times \cdot 1875 = \$104 \cdot 165625.$

(11)

617 bush. at $\$1 \cdot 70 = \$1048 \cdot 90.$
$\$1048 \cdot 90 \times \cdot 125 = \$131 \cdot 1125.$

(12)

$\$1122{\cdot}30 \times {\cdot}33\frac{1}{3} = \$374{\cdot}10.$

(13)

$\$8765{\cdot}40 \times {\cdot}0375 = \$328{\cdot}7025.$

(14)

$\$7800 \times {\cdot}07 = \$546.$

(15)

$\$907{\cdot}80 \times {\cdot}15 = \$136{\cdot}17.$

(16)

$\$7{\cdot}87\frac{1}{2} \times 7400 = \$58275{\cdot}00.$

$\$58275{\cdot}00 \times {\cdot}0825 = \$4807{\cdot}6875.$

(17)

$\$7450 \times {\cdot}025 = \$186{\cdot}25.$

(18)

$\$1140 \times {\cdot}03375 = \$38{\cdot}475.$

EXERCISE 64.

(1)

$\$789{\cdot}46 \times {\cdot}0275 = \$21{\cdot}71015.$

(2)

$\$8167{\cdot}50 \times {\cdot}022 = \$179{\cdot}685.$

(3)

$\$8900 \times {\cdot}032 = \$284{\cdot}80.$

(4)

$\$8740 \times {\cdot}00375 = \$32{\cdot}775.$

(5)

$\$1888 \times \cdot 004 = \$7 \cdot 552.$

(6)

$\$11247 \cdot 60 \times \cdot 0125 = \$140 \cdot 595.$

(7)

$\$4780 \times \cdot 01375 = \$65 \cdot 725.$

(8)

$\$27490 \times \cdot 026 = \$714 \cdot 74.$

(9)

$\$8790 \times \cdot 02125 = \$186 \cdot 7875.$

(10)

$\$17496 \cdot 50 \times \cdot 00875 = \$153 \cdot 094375.$

EXERCISE 65.

(1)

$\$100$ stock $= \$117 \cdot 25$ money or $\$1 \cdot 00$ stock
$= \$1 \cdot 1725$ money

$\$793 \div \$1 \cdot 1725 = \$7930000 \div 11725 = \$676 \cdot 3326$

(2)

$\$100$ stock $= \$90 \cdot 50$ money or $\$1$ stock $= \$0 \cdot 905$ money

$\$0 \cdot 905 \times 9476 = \$8575 \cdot 78$

(3)

$\$125 \times 9 = \$1125$

$\$100$ stock $= \$108 \cdot 375$ money or $\$1$ stock
$= \$1 \cdot 08375$ money

$\$1 \cdot 08375 \times 1125 = \$1219 \cdot 21875$

(4)

$111·216 × 17 = $1890·672
$100 stock = $103·50 money or $1 stock
= $1·035 money
$1·035 × 1890·672 = $1956·84552

(5)

$100 stock = $88 money or $1 stock = $0·88 money
$0·88 × 6470 = $5693·60

(6)

$100 stock = $106·25 money or $1 stock
= $1·0625 money
$2000 ÷ $1·0625 = $20000000 ÷ $10625
= $1882·3529

(7)

$100 stock = $127 money or $1 stock = $1·27 money
$7000 ÷ $1·27 = $700000 ÷ $127 = $5511·81102

(8)

$100 stock = $92 money or $1 stock = $0·92 money
$0·92 × 6140 = $5648·80

(9)

$25 × 27 = $675
$100 stock = $101·25 money or $1 stock
= $1·0125 money
$1·0125 × 675 = $683·4375

(10)

$100 stock = $113·50 money or $1 stock
= $1·135 money
$11120 ÷ $1·135 = $11120000 ÷ $1135 = $9797·3568

EXERCISE 66.

(1)

$\$974 \times \cdot 11 = \$107 \cdot 14$

(2)

$\$1678 \cdot 90 \times \cdot 09 = \$151 \cdot 101 \times 7 = \$1057 \cdot 707$

(3)

$\$142 \cdot 70 \times \cdot 08 = \$11 \cdot 416$; $\$11 \cdot 416 \times 16 = \$182 \cdot 656$

(4)

$\$80 \cdot 80 \times \cdot 07 = \$5 \cdot 656$; $\$5 \cdot 656 \times 22 = \$124 \cdot 432$

(5)

$\$67 \cdot 49 \times \cdot 025 = \$1 \cdot 68725$; $\$1 \cdot 68725 \times 6 = \$10 \cdot 1235$

(6)

$\$208 \cdot 60 \times \cdot 03375 = \$7 \cdot 04025$; $\$7 \cdot 04025 \times 11 = \$77 \cdot 44275$

(7)

$\$800 \times \cdot 08 = \$64 =$ interest for 1 year.

4 mos.	$\frac{1}{3}$	$64			
		6			
		38	4	= interest for 6 years.	
1 mo.	$\frac{1}{4}$	21	$33\frac{1}{3}$	"	4 mos.
10 dys	$\frac{1}{3}$	5	$33\frac{1}{3}$	"	1 "
5 dys.	$\frac{1}{2}$	1	$77\frac{7}{9}$	"	10 days.
$2\frac{1}{2}$ dys	$\frac{1}{2}$		$88\frac{8}{9}$	"	5 "
$\frac{1}{2}$ dy	$\frac{1}{5}$		$44\frac{4}{9}$	"	$2\frac{1}{2}$ "
			$08\frac{8}{9}$	"	$\frac{1}{2}$ "

$\$413$ $86\frac{2}{3}$ interest for 6 yrs. 5 mos. 18 dys.

(8)

$\$7400 \times \cdot0625 = \$462\cdot50$ = interest for 1 year.

6 mos.	$\frac{1}{2}$	$\$\ 462\cdot50$	
4 mos.	$\frac{1}{3}$	9	
		$4162\cdot50$	= interest for 9 years.
		$231\cdot25$	" 6 mos.
1 mo.	$\frac{1}{4}$	$154\cdot16\frac{2}{3}$	" 4 "
15 dys.	$\frac{1}{2}$	$38\cdot54\frac{1}{6}$	" 1 "
$7\frac{1}{2}$ dys.	$\frac{1}{2}$	$19\cdot27\frac{1}{12}$	" 15 days.
$1\frac{1}{2}$ "	$\frac{1}{5}$	$9\cdot63\frac{13}{24}$	" $7\frac{1}{2}$ "
		$1\cdot92\frac{17}{24}$	" $1\frac{1}{2}$ "
		$\$4617\ 29\frac{1}{6}$	= interest for 9 yrs. 11m. 24d.

Otherwise 9 yrs. 11 mos. 24 days $= 9\cdot98\frac{1}{3}$ years.

$\$462\cdot50 \times 9\cdot98\frac{1}{3} = \$4617\cdot29\frac{1}{6}$

(9)

$\$9680\cdot80 \times \cdot03 = \$290\cdot424$ = interest for 1 year.

$\$290\cdot424 \times 14\frac{1}{3} = \$4162\cdot744$.

(10)

$\$476\cdot76 \times \cdot0575 = \$27\cdot4137$ = interest for 1 year.

$\$27\cdot4137 \times 10\frac{2}{3} = \$292\cdot4128$ = int. for 10 yrs. 8 mos.

(11)

$\$8900 \times \cdot1125 = \$1001\cdot25$ = interest for 1 year.

4 mos.	$\frac{1}{3}$	$\$1001\cdot25$	
		6	
		$\$6007\cdot50$	= in. for 6ys
2 mos.	$\frac{1}{6}$	$333\cdot75$	= in. for 4ms
1 mo.	$\frac{1}{2}$	$166\cdot875$	= in. for 2ms
15 days	$\frac{1}{2}$	$83\cdot4375$	= in. for 1m
10 days	$\frac{1}{3}$	$41\cdot71875$	= in. for 15ds
2 days	$\frac{1}{5}$	$27\cdot8125$	= in. for 10ds
1 day	$\frac{1}{2}$	$5\cdot5625$	= in. for 2ds
		$2\cdot78125$	= in. for 1d
		$\$6669\cdot4375$	6ys 7ms 28ds

(12)

$\$8160 \times \cdot 075 = \$612$; $\$612 \times 9\frac{1}{24} = \$5533 \cdot 50$.

(13)

$\$412 \cdot 90 \times \cdot 04875 = \$20 \cdot 128875$ = interest for 1 year.
$\$20 \cdot 128875 \times 6 = \$120 \cdot 77325$.

(14)

$\$127 \cdot 40 \times \cdot 125 = \$15 \cdot 925$ = interest for 1 year.

3 mos.	$\frac{1}{4}$	$\$15 \cdot 925$	
		3	
		$47 \cdot 775$	= int. for 3 ys
3 days	$\frac{1}{30}$	$3 \cdot 98125$	= int. for 3 ms
		$\cdot 13270\frac{25}{30}$	= int. for 3 ds
		$\$51 \cdot 888954\frac{5}{6}$	= int. for 3 ys 3 ms 3 ds

(15)

$\$80 \cdot 63 \times \cdot 0297 = \$2 \cdot 394711$ = interest for 1 year.
$\$2 \cdot 394711 \times 4 \cdot 78 = \$11 \cdot 44671858$ = int. for $4 \cdot 78$ yrs.

(16)

$\$106 \cdot 70 \times \cdot 1347 = \$14 \cdot 37249$ = interest for 1 year.
$\$14 \cdot 37249 \times 11 \cdot 113 = \$159 \cdot 72148137$ = interest for $11 \cdot 113$ years.

EXERCISE 67.

1. $\frac{1}{2}$ of 8 = 4 cents = \$0·04; $\frac{1}{2}$ of 7 = 3·5 cents = \$0·035; $\frac{1}{2}$ of 11 = 5·5 cents = \$0·055.
2. 2 yrs. 9 mos. = 33 mos.; $33 \div 2 = 16 \cdot 5$ cents = \$0·165.
3. 16 yrs. 4 mos. = 196 mos.; $196 \div 2 = 98$ cents = \$0·98.

4. 5 yrs. 11 mos. = 71 mos.; 71 ÷ 2 = 35·5 cents = $0·355.

5. 11 yrs. 1 mo. = 133 mos.; 133 ÷ 2 = 66·5 cents = $0·665.

6. 10 yrs. 10 mos. = 130 mos.; 130 ÷ 2 = 65 cents = $0·65.

7. 4 yrs. 5 mos. = 53 mos.; 53 ÷ 2 = 26·5 cents = $0·265.

(8)

6 yrs. 3 mos. 12 days = 75 mos. 12 days.

75 ÷ 2 = 37·5 cents = interest for 75 mos.

12 ÷ 6 = ·2 cents = interest for 12 days.

37·7 cents = $0·377 = int. for 6 ys. 3 mos. 12 days.

(9)

3 yrs. 3 mos. 3 days = 39 mos. 3 days.

39 ÷ 2 = 19·5 cents = interest for 39 mos.

3 ÷ 6 = ·05 cents = interest for 3 days.

19·55 cts. = $0·1955 = int. for 3 ys 3 ms 3 dys

(10)

4 yrs. 7 mos. 10 days = 55 mos. 10 days.

55 ÷ 2 = 27·5 cents = interest for 55 mos.

10 ÷ 6 = ·1$\dot{6}$ cents = interest for 10 days.

27·6$\dot{6}$ cts = $0·2766$\dot{6}$ = int. for 4 ys 7 mos 10 ds

(11)

1 yr. 9 mos. 25 days = 21 mos. 25 days.

21 ÷ 2 = 10·5 cents = interest for 21 mos.

25 ÷ 6 = ·41$\dot{6}$ cents = interest for 25 days.

10·91$\dot{6}$ cts = $0·1091$\dot{6}$ = int. for 1 yr 9 ms 25 ds

(12)

2 yrs. 7 mos. 17 days = 31 mos. 17 days.

$31 \div 2 = 15{\cdot}5$ cents = interest for 31 mos.

$17 \div 6 = \cdot283$ cents = interest for 17 days.

$15{\cdot}783 = \$0{\cdot}15783$ = int. for 2ys 7 mos 17ds.

EXERCISE 38.

(1)

Interest of \$1 for 7 yrs. 9 ms. = 93 cents $\div$ 2 = \$0·465

\$0·465 × 1904 = \$885·36

(2)

Interest of \$1 for 4 yrs. 11 ms. = 59 cents $\div$ 2 = \$0·295

\$0·295 × 274·80 = \$81·066

(3)

Interest of \$1 for 3 yrs. 2 ms. 12 dys. = \$0·132

\$0·132 × 671·90 = \$88·6908

(4)

Interest of \$1 for 3 yrs. 3 ms. 3 days. = \$0·1955

\$0·1955 × 213·27 = \$41·694285

(5)

Interest of \$1 for 4 yrs. 4 ms. 4 days = \$0·260$\frac{2}{3}$

\$0·260$\frac{2}{3}$ × 49·73 = \$12·96295$\frac{1}{3}$

(6)

Interest of \$1 for 5 yrs. 5 ms. 5 days = \$0·3258$\frac{1}{3}$

\$0·3258$\frac{1}{3}$ × 619·80 = \$201·9515

(7)

Interest of \$1 for 6 yrs. 6 ms. 6 days = \$0·391

\$0·391 × 27·60 = \$10·7916

(8)

Interest of $1 for 7 years 7 ms. 7 days = $0·456$\frac{1}{6}$

$0·456$\frac{1}{6}$ × 47·32 = $21·58580$\frac{2}{3}$

(9)

Interest of $1 for 8 yrs. 8 ms. 8 days = $0·521$\frac{1}{3}$

$0·521$\frac{1}{3}$ × 222·22 = $115·85069$\frac{1}{3}$

(10)

Interest of $1 for 9 yrs. 9 ms. 9 days = $0·5865

$0·5865 × 345·67 = $202·735455

(11)

Interest of $1 for 10 yrs. 10 ms. 10 days = $0·651$\frac{2}{3}$

$0·651$\frac{2}{3}$ × 7[illegible]23 × $514·31488$\frac{1}{3}$

(12)

Interest of $1 for 11 yrs. 11 ms. 11 days = $0·716$\frac{5}{6}$

$0·716$\frac{5}{6}$ × 809 = $579·918$\frac{1}{6}$ = $579·91816$\frac{2}{3}$

(13)

Interest of $1 for 3 yrs. 24 days = $0·184

$0·184 × 207·40 = $38·1616

(14)

Interest of $1 for 1 yr. 28 days = $0·064$\frac{2}{3}$

$0·064$\frac{2}{3}$ × 98·20 = $6·35026$\frac{2}{3}$

(15)

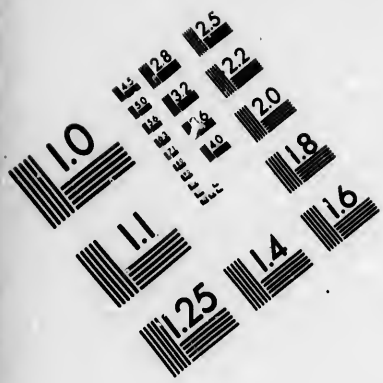
Interest of $1 for 2 yrs. 7 mos. 15 days = $0·1575

$0·1575 × 76·42 = $12·03615

(16)

Interest of $1 for 2 yrs. 5 ms. 20 days = $0·148$\frac{1}{3}$

$0·148$\frac{1}{3}$ × 9146·70 = $1356·7605



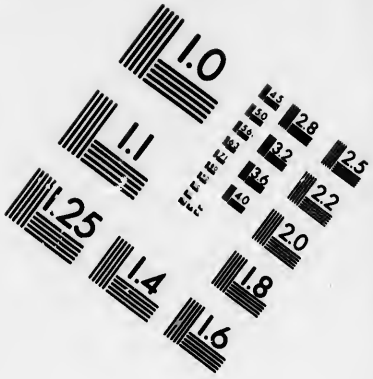
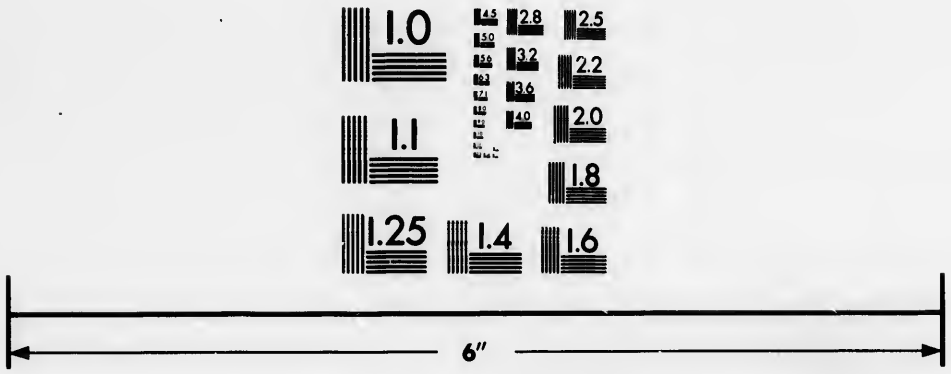
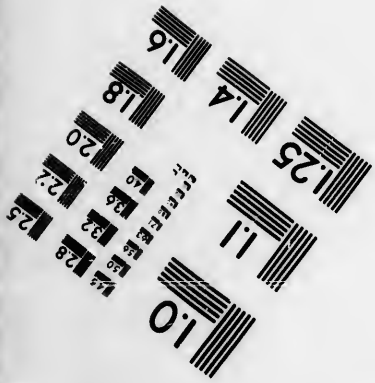
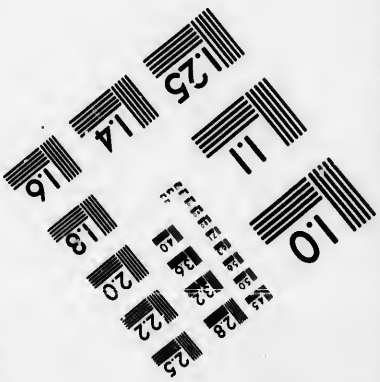


IMAGE EVALUATION TEST TARGET (MT-3)







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1.25
1.28
1.22
1.32
1.20
1.35
1.18

1.0
1.1

EXERCISE 69.

(1)

$1000 × ·07 = $70 = interest for 1st year.
$1070 × ·07 = $74·90 = interest for 2nd year.
$1144·90 × ·07 = $80·143 = interest for 3rd year.
$1225·043 = amount at end of 3rd year.
$1225·043 — $1000 = $225·043 = interest.

(2)

$800 × ·06 = $48 = interest for 1st year.
$800 + $48 = $848 = amount at end of 1st year.
$848 × ·06 = $50·88 = interest for 2nd year.
$848 + $50·88 = $898·88 = amount at end of 2d year.
$898·88 × ·06 = $53·9328 = interest for 3d year.
$898·88 + $53·9328 × $952·8128 = amount at end of 3rd year.
$952·8128 × ·06 = $57·168768 = interest for 4th year.
$952·8128 + $57·168768 = $1009·981568 = amount at end of 4th year.
$1009·981568 — $800 = $209·981568 = interest.

(3)

$900 × ·06 = $54 = interest for 1st year.
$900 + $54 = $954 = amount at end of 1st year.
$954 × ·06 = $57·24 = interest for 2nd year.
$954 + $57·24 = $1011·24 = amount at end of 2d year.
$1011·24 × ·06 = $60·6744 = interest for 3rd year.
$1011·24 + $60·6744 = $1071·9144 = amount at end of 3d year.
$1071·9144 × ·06 = $64·314864 = int. for 4th year.
$1071·9144 + $64·314864 = $1136·229264 = amt. at end of 4th year.
$1136·229264 × ·06 = $68·17375584 = in. for 5th yr.
$1136·229264 + $68·17375584 = $1204·40301984 = amt. at end of 5th year.
$1204·40301984 — $900 = $304·40301984 = int.

(4)

$600 × ·04 = $24 = int. for 1st half-year.
$600 + $24 = $624 = amt. at end of 1st half-year.
$624 × ·04 = $24·96 = int. for 2d half-year.
$624 + $24·96 = $648·96 = amt. at end of 2d hf.-yr.
$648·96 × ·04 = $25·9584 = int. for 3d half-year.
$648·96 + $25·9584 = $674·9184 = amt. at end of 3d half-year.
$674·9184 × ·04 = $26·996736 = int. for 4th half-yr.
$674·9184 + $26·996736 = $701·915136 = amt. at end of 4th half-year.
$701·915136 — $600 = $101·915136 = int.

(5)

$250 × ·035 = $8·75 = int. for 1st half-year.
$250 + $8·75 = $258·75 = amt. at end of 1st hf.-yr.
$258·75 × ·035 = $9·05625 = int. for 2d half-year.
$258·75 + $9·05625 = $267·80625 = amt. at end of 2d half-year.
$267·80625 × ·035 = $9·37321875 = in. for 3d. hf.-yr.
$267·80625 + $9·37321875 = $277·17946875 = amt. at end of 3d half-year.
$277·17946875 × ·035 = $9·70128140625 = int. for 4th half-year.
$277·17946875 + $9·7012814625 = $286·88075015625 = amt. at end of 2d year.
$236·88075015625 — $250 = $36·88075015625 = int.

(6)

$880 × ·02 = $17·60 = int. for 1st quarter.
$880 + $17·60 = $897·60 = amt. at end of 1st quar.
$897·60 × ·02 = $17·952 = int. for 2d quarter.
$897·60 + $17·952 = $915·552 = amt. at end of 2d qr.

(Continued on next page.)

(6) continued.

$915·552 × ·02 = $18·31104 = int. for 3d quarter.

$915·552 + $18·31104 = $933·86304 = amt. at end of 3d quarter.

$933·86304 × ·02 = $18·6772608 = int. for 4th quar.

$933·86304 + $18·6772608 = $952·5403008 = amt. at end of 4th quarter.

$952·5403008 × ·02 = $19·050806016 = int. for 5th qr.

$952·5403008 + $19·050806016 = $971·591106816 = amt. at end of 5th quarter.

$971·591106816 × ·02 = $19·43182213632 = int. for 6th quarter.

$971·591106816 + $19·3182213632 = $991·02292895232 = amt. at end of 6th quarter.

$991·02292895232 — $880 = $111·02292895232 = int.

(7)

$500 × ·075 = $37·50 = int. for 1st year.

$500 + $37·50 = $537·50 = amt. at end of 1st year.

$537·50 × ·075 = $40·3125 = int. for 2d year.

$537·50 + $40·3125 = $577·8125 = amt. at end of 2d year.

$577·8125 × ·075 = $43·3359375 = int. for 3d year.

$577·8125 + $43·3359375 = $621·1484375 = amount.

$621·1484375 — $500 = $121·1484375 = interest.

(8)

$400 × ·045 = $18 = int. for 1st half-year.

$400 + $18 = $418 = amt. at end of 1st half-year.

$418 × ·045 = $18·81 = int. for 2d half-year.

$418 + $18·81 = $436·81 = amt. at end of 2d hf.-yr.

$436·81 × ·045 = $19·65645 = int. for 3d half-year.

$436·81 + $19·65645 = $456·46645 = amt. at end of 3d half-year.

$456·46645 × ·045 = $20·54099025 = int. for 4th hf.-yr.

$456·46645 + $20·54099025 = $477·00744025 = amt.

$477·00744025 — $400 = $77·00744025 = int.

(9)

$714·90 × ·025 = $17·8725 = int. for 1st quarter.
Add 714·90
Sum = $732·7725 = amt. at end of 1st quar.
$732·7725 × ·025 = $18·3193125 = int. for 2d quar.
Add 732·7725
Sum = $751·09181 = amt. at end 2d qr.
$751·09181 × ·025 = $18·777294 = int. for 3d quarter.
Add 751·09181
Sum = $769·8691 = amt. at end of 2d qr.
$769·8691 × ·025 = $19·246727 = int. for 4th quar.
Add 769·8691
Sum = $789·1158 = amt. at end 4th qr.
$789·1158 × ·025 = $19·727895 = int. for 5th quar.
Add 789·1158
Sum = $808·8437 = amt. at end 5th qr.
$808·8437 × ·025 = $20·221092 = int. for 6th quar.
Add 808·8437
Sum = $829·0648 = amt. at end 6th quar.
$829·0648 × ·025 = $20·72662 = int. for 7th quar.
Add 829·0648
Sum = $849·7914 = amt. at end 7th qr.
$849·7914 × ·025 = $21·244785 = int. for 8th quar.
Add 849·7914
Sum = $871·0362 = required amt.
Subtract $714·90
Differ. = $156·1362 = required int.

(10)

$794·60 × ·045 = $35·757 = int. for 1st half-year.
Add 794·60

Sum = $830·357 = amt. at end of 1st half-yr.
$830·357 × ·045 = $37·366065 = int. for 2d half-year.
Add 830·357

Sum = $867·723065 = amt. at end 2d hf.-yr.
$867·723065 × ·04½ = $39·047537925 = in. 3d hf.-yr.
Add 867·723065

Sum = $906·7706 = amt. requi'd.
Subtract $794·60

Remainder = $112·1706 = int. required.

EXERCISE 70.

(1)

Interest of $1 at 7 per cent for 1 year = $0·07.
Interest of $1 at 7 per cent for 3 mos. = ¼ of $0·07 = $0·0175.
Amount of $1 at 7 per cent for 3 mos. = $1·0175.
$740 ÷ 1·0175 = $7400000 ÷ 10175 = $727·2727 = present worth.
$740 — $727·2727 = $12·7273 = discount.

(2)

Interest of $1 at 9 per cent for 1 year = $0·09.
Interest of $1 at 9 per cent for 2 mos. = ⅙ of $0·09 = 0·015.
Amount of $1 for 2 mos. at 9 per cent = $1·015.
$90 ÷ 1·015 = 90000 ÷ 1015 = $88·6699 = present worth.
$90 — $88·6699 = $1·3301 = discount.

(3)

Amount of $1 for 6 months at 6 per cent = $1·03.

$250 ÷ 1·03 = $25000 ÷ 103 = $242·7184 = present worth.

$250 — $242·7184 = $7·2816 = discount.

(4)

Amount of $1 for 11 mos. at 11 per cent = $1·10$\frac{1}{2}$.

$714·20 ÷ 1·10$\frac{1}{2}$ = $71420 ÷ 110$\frac{1}{2}$ = 857040 ÷ 1321* = $648·7812 = present worth.

714·20 — $648·7812 = $65·4188 = discount.

(5)

Amount of $1 for 5 mos. at 8 per cent = $1·03$\frac{1}{3}$.

$911·40 ÷ 1·03$\frac{1}{3}$ = $91140 ÷ 103$\frac{1}{3}$ = $273420 ÷ 310† = $882·00 = present worth.

$911·40 — $882 = $29·40 = discount.

(6)

Amount of $1 for 4 mos. at 7 per cent = $1·02$\frac{1}{3}$.

$671·43 ÷ 1·02$\frac{1}{3}$ = $67143 ÷ 102$\frac{1}{3}$ = $201429 ÷ 307‡ = $656·1205 = present worth.

$671·43 ÷ $656·1205 = $15·3095 = discount.

(7)

Amount of $1 for 2 years at 4 per cent = $1·08.

$947·60 ÷ 1·08 = $94760 ÷ 108 = $877·4074 = present worth.

$947·60 — $877·4074 = $70·1926 = discount.

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* Multiplying each by 12.

† Multiplying each by 3.

‡ Multiplying each by 3 to clear of fractions.

(8)

Amount of \$1 for 16 mos. at 7 per cent = \$1·09⅓.

\$888·93 ÷ 1·09⅓ = \$88893 ÷ 109⅓ = \$266679 ÷ 328 = \$813·0457 = present worth.

\$888·93 — \$813·0457 = \$75·8843 = discount.

(9)

Interest of \$1 for 1 year at 10 per cent = \$0·10.

Interest of \$1 for 47 days at 10 per cent = 47/365 of \$0·10 = \$0·01 7/73.

Amount of \$1 for 47 days at 10 per cent = \$1·01 7/73.

\$7146·90 ÷ 1·01 7/73 = \$714690 ÷ 101 7/73 = \$52172370 ÷ 7394 = \$7056·0413 = present worth.

\$7146·90 — \$7056·0413 = \$90·8587 = discount.

(10)

Amount of \$1 for 2 mos. at 7 per cent. = \$1·01⅙.

\$710 ÷ 1·01⅙ = \$71000 ÷ 101⅙ = \$426000 ÷ 607 = \$701·8121 = present worth.

\$710 — \$701·8121 = \$8·1879 = discount.

(11)

Amount of \$1 for 1¼ mos. at 7 per cent. = \$1·008¾.

\$1100 ÷ 1·008¾ = \$1100000 ÷ 1008¾ = \$4400000 ÷ 4035 = \$1090·4584 = present worth.

\$1100 — \$1090·4584 = \$9·5416 = discount.

(12)

Amount of \$1 for 2⅓ months at 6 per cent. = \$1·01⅙.

\$6714·83 ÷ 1·01⅙ = \$671483 ÷ 101⅙ = \$4028898 ÷ 607 = \$6637·3937 = present worth.

\$6714·83 — \$6637·3937 = \$77·4363 = discount.

Exercise 71.

(1)

42 days + 3 days = 45 days = $1\frac{1}{2}$ mos. = $\frac{1}{8}$ of a year.
Interest of \$700 at 7 per cent. for 1 year = \$49.
$\frac{1}{8}$ of \$49 = \$6·125 = discount required for 45 days.

(2)

57 + 3 = 60 days = 2 months = $\frac{1}{6}$ of a year.
Interest of \$840 for 1 year at 8 per cent. = \$67·20.
$\frac{1}{6}$ of \$67·20 = \$11·20 = discount required for 2 mos.

(3)

4 mos. + 3 days = 4 mos. and 3 days.
\$790 × ·05 = \$39·50 = interest for 1 year.

3 mos.	$\frac{1}{4}$	\$39·50
		9·87$\frac{1}{2}$ = interest for 3 mos.
1 mo.	$\frac{1}{3}$	3·29$\frac{1}{6}$ = " " 1 mo.
3 days	$\frac{1}{10}$	·32$\frac{11}{12}$ = " " 3 dys.
		\$13·49$\frac{7}{12}$ = disc. required for 4 m. 3 dys.

(4)

2 months + 3 days = 2 months and 3 days.
\$614·30 × ·07 = \$43·001 = interest for 1 year.

2 mos.	$\frac{1}{6}$	\$43·001
		7·1668333 = interest for 2 mos.
3 days	$\frac{1}{120}$	·3583416 = " " 3 days.
		\$7·5251749 = \$7·5251745 = discount required for 2 mos. 3 days.

(5)

7 mos + 3 days = 7 mos. and 3 days.

$217·20 × ·09 = $19·548 = interest for 1 year.

6 mos.	½	$19·548
1 mo.	⅙	9·774 = interest for 6 mos.
3 days	1/10	1·629 = " " 1 mo.
		·1629 = " " 3 days.
		$11·5659 = discount required for 7 mos. 3 days.

(6)

20 days + 3 days = 23 days.

$94·80 × ·10 = $9·48 = interest for 1 year.

20 days	1/18	$9·48
2 "	1/10	·526⅔ = interest for 20 days.
1 "	½	·052⅔ = " " 2 "
		·026⅓ = " " 1 "
		$0·605⅔ = discount required for 23 dys.

EXERCISE 72.

(1)

$$\$7000 : \$2700 :: \$1700 : \text{A's profit} = \frac{\$2700 \times 1700}{7000}$$

$$= \$655·71\tfrac{3}{7}.$$

$$\$7000 : \$4200 :: \$1700 : \text{B's profit} = \frac{\$1700 \times 4200}{7000}$$

$$= \$1020.$$

$655·71⅜ + $1020·00 = $1675·71⅜.

$1700·00 — $1675·71⅜ = $24·28⅝ = C's profit.

(2)

$\$29000 : \$17400 :: \$904{\cdot}70 :$ B's loss

$$= \frac{\$904{\cdot}70 \times \$174000}{29000} = \$542{\cdot}82.$$

$\$904{\cdot}70 - 542{\cdot}82 = \$361{\cdot}88 =$ C's loss.

(3)

$21 + 17 + 47 = 85$ cows.

$$85 : 21 :: \$307 : \text{1st share} = \frac{\$307 \times 21}{85} = \$75{\cdot}84\tfrac{12}{17}.$$

$$85 : 17 :: \$307 : \text{2nd share} = \frac{\$307 \times 17}{85} = \$61{\cdot}40.$$

$$85 : 47 :: \$307 : \text{3rd share} = \frac{\$307 \times 47}{85} = \$169{\cdot}75\tfrac{5}{17}.$$

(4)

$\$4 + \$7 + \$9 = \$20.$

$$\$20 : \$4 :: \$7493 : \text{A's share} = \frac{\$7493 \times 4}{20} = \$1498{\cdot}60.$$

$$\$20 : \$7 :: \$7493 : \text{B's share} = \frac{\$7493 \times 7}{20} = \$2622{\cdot}55.$$

$$\$20 : \$9 :: \$7493 :: \text{C's share} = \frac{\$7493 \times 9}{20} = \$3371{\cdot}85.$$

(5)

$1\frac{3}{4} + 2\frac{1}{2} + 5\frac{1}{4} = 9\frac{1}{2}.$

$9\frac{1}{2} : 1\frac{3}{4} :: \$7500 :$ share of 1st $= \$7500 \times 1\frac{3}{4} \div 9\frac{1}{2}$

$$= \frac{\$7500 \times 7 \times 2}{4 \times 19} = \$1381{\cdot}57\tfrac{17}{19}.$$

(Continued on next page.)

(5) continued.

$9\frac{1}{2} : 2\frac{1}{2} :: \$7500 : \text{share of 2nd} = \$7500 \times 2\frac{1}{2} \div 9\frac{1}{2}$

$$= \frac{\$7500 \times 5 \times 2}{2 \times 19} = \$1973 \cdot 68\tfrac{8}{19}.$$

$9\frac{1}{2} : 5\frac{1}{4} :: \$7500 : \text{share of 3d} = \$7500 \times 5\frac{1}{4} \div 9\frac{1}{2}$

$$= \frac{\$7500 \times 21 \times 2}{4 \times 19} = \$4144 \cdot 73\tfrac{13}{19}.$$

(6)

$$\$8900 : \$4700 :: \$3200 : \text{A's share} = \frac{\$3200 \times 4700}{8900}$$

$$= \$1689 \cdot 88\tfrac{88}{89}.$$

$\$3200 - \$1689 \cdot 88\frac{88}{89} = \$1510 \cdot 11\frac{21}{89} = \text{B's share.}$

(7)

$\$3 + \$4 \cdot 20 + \$7 \cdot 49 = \$14 \cdot 69.$

$$\$14 \cdot 69 : \$3 :: \$9000 : \frac{\$9000 \times 3}{14 \cdot 69} = \$1837 \cdot 98\tfrac{738}{1469}$$

$= \text{A's share.}$

$$\$14 \cdot 69 : \$4 \cdot 20 :: \$9000 : \frac{\$9000 \times 4 \cdot 20}{14 \cdot 69}$$

$$= \$2573 \cdot 17\tfrac{1337}{1469} = \text{B's share.}$$

$$\$14 \cdot 69 : \$7 \cdot 49 :: \$9000 : \frac{\$9000 \times 7 \cdot 49}{14 \cdot 69}$$

$$= \$4588 \cdot 83\tfrac{873}{1469} = \text{C's share.}$$

(8)

$\$14900 - \$4250 = \$10650 = \text{total loss.}$

$1 : \frac{1}{2} :: \$10650 : \$10650 \times \frac{1}{2} = \$5325 = \text{A's share.}$

$1 : \frac{1}{5} :: \$10650 : \$10650 \times \frac{1}{5} = \$2130 = \text{B's share.}$

$1 : \frac{3}{10} :: \$10650 : \$10650 \times \frac{3}{10} = \$3195 = \text{C's share.}$

(9)

$\frac{1}{2} + \frac{2}{5} + \frac{4}{7} = \frac{35}{140} + \frac{56}{140} + \frac{80}{140} = \frac{171}{140}$.

$\frac{171}{140} : \frac{35}{140} :: \$4942 : \$4942 \times \frac{35}{140} \div \frac{171}{140}$

$= \frac{\$4942 \times 35}{171} = \$1011 \cdot 52\frac{8}{171}$ = 1st part.

$\frac{171}{140} : \frac{56}{140} :: \$4942 : \$4942 \times \frac{56}{140} \div \frac{171}{140}$

$= \frac{\$4942 \times 56}{171} \$1618 \cdot 43\frac{47}{171}$ = 2nd part.

$\frac{171}{140} : \frac{80}{140} :: \$4942 : \$4942 \times \frac{80}{140} \div \frac{171}{140}$

$= \frac{\$4942 \times 80}{171} = \$2312 \cdot 04\frac{116}{171}$ = 3rd part.

(10)

$\$7490 + \$2980 = \$10470$ = whole debt.

$\$10470 : \$7490 :: \$7490 : \frac{\$7490 \times 7490}{10470}$

$= \$5358 \cdot 17\frac{601}{1047}$ = what A should receive.

$\$7490 - \$5358 \cdot 17\frac{601}{1047} = \$2131 \cdot 82\frac{446}{1047}$ = what B should receive.

Exercise 73.

(1)

$40 \times 37 = 1480$

$36 \times 52 = 1872$

Sum $= 3352$

$3352 : 1480 :: \$4600 : \frac{\$4600 \times 1480}{3352} \$2031 \cdot 02\frac{268}{419}$

= A's share.

$\$4600 - \$2031 \cdot 02\frac{268}{419} = \$2568 \cdot 97\frac{147}{419}$ = B's share.

(2)

$\$2000 \times 7 = \$14000$
$\$1800 \times 11 = \$19800$
$\$1600 \times 12 = \$19200$
Sum $= \$53000$

$\$53000 : \$14000 :: \$2400 : \frac{\$2400 \times 14000}{53000}$

$= \$633 \cdot 96\frac{12}{53} =$ A's share.

$53000 : 19800 :: \$2400 : \frac{\$2400 \times 19800}{53000}$

$= \$896 \cdot 60\frac{20}{53} =$ B's share.

$53000 : 19200 :: \$2400 : \frac{\$2400 \times 19200}{53000}$

$= \$869 \cdot 43\frac{7}{53} =$ C's share.

(3)

$34 \times 10 = 340$
$15 \times 36 = 540$
Sum $= 880$

$880 : 340 :: \$2000 : \frac{\$2000 \times 340}{880} = \$772 \cdot 72\frac{8}{11}$

$=$ A's share.

$\$2000 - \$772 \cdot 72\frac{8}{11} = \$1227 \cdot 27\frac{3}{11} =$ B's share.

(4)

$27 \times 4 = 108$
$20 \times 5 = 100$
$24 \times 3\frac{1}{4} = 84$

Sum $= 292$

$$292 : 108 :: \$120 : \frac{\$120 \times 108}{292} = \$44 \cdot 38\frac{36}{73}.$$

$$292 : 100 :: \$120 : \frac{\$120 \times 100}{292} = \$41 \cdot 09\frac{43}{73}$$

$$292 : 84 :: \$120 : \frac{\$120 \times 84}{292} = \$34 \cdot 52\frac{4}{73}.$$

(5)

$\$2400 \times 11 = \$26400$
$\$3000 \times 4 = \$12000$
$\$2000 \times 9 = \$18000$
$\$2600 \times 12 = \$31200$

Sum $= \$87600$

$$\$87600 : \$26400 :: \$2500 : \frac{\$2500 \times 26400}{87600}$$

$= \$753 \cdot 42\frac{34}{73} =$ A's share.

$$\$87600 : \$12000 :: \$2500 : \frac{\$2500 \times 12000}{87600}$$

$= \$342 \cdot 46\frac{42}{73} =$ B's share.

$$\$87600 : \$18000 :: \$2500 : \frac{\$2500 \times 18000}{87600}$$

$= \$513 \cdot 69\frac{63}{73} =$ C's share.

$$\$87600 : \$31200 :: \$2500 : \frac{\$2500 \times 31200}{87600}$$

$= \$890 \cdot 41\frac{7}{73} =$ D's share.

(6)

$$\begin{aligned} \$700 \times 8 &= \$5600 \\ \$1000 \times 11 &= 11000 \\ 600 \times 17 &= 10200 \\ \text{Sum} &= \$26800 \end{aligned}$$

$$\$26800 : \$5600 :: \$950 : \frac{\$950 \times 5600}{26800} = \$198 \cdot 50\tfrac{50}{67}.$$

$$\$26800 : \$11000 :: \$950 : \frac{\$950 \times 11000}{26800} = \$389 \cdot 92\tfrac{31}{67}.$$

$$\$26800 : \$10200 :: \$950 : \frac{\$950 \times 10200}{26800} = \$361 \cdot 56\tfrac{17}{67}.$$

(7)

$$\left.\begin{aligned} \$10000 \times 7 &= \$70000 \\ 6000 \times 5 &= 30000 \end{aligned}\right\} = \$100000 = \text{product of A's stock and time.}$$

$$\$7000 \times 5 = 35000 = \text{do. B's do.}$$

$$\text{Sum} = \$135000$$

$$\$135000 : \$100000 :: \$3000 : \frac{\$3000 \times 100000}{135000}$$

$$= \$2222 \cdot 22\tfrac{2}{9} = \text{A's share.}$$

$$\$3000 - \$2222 \cdot 22\tfrac{2}{9} = \$777 \cdot 77\tfrac{7}{9} = \text{B's share.}$$

(10)

$$\left.\begin{aligned} \$35000 \times 2 &= \$70000 \\ 24000 \times 3 &= 72000 \\ 20000 \times 2 &= 40000 \end{aligned}\right\} = \$182000 = \text{A's st'k for 1 mo.}$$

$$\$11000 \times 5 = 55000 = \text{B's do. do.}$$

$$\$4000 \times 2 = 8000 = \text{C's do. do.}$$

$$\text{Sum} = \$245000$$

(Continued on next page.)

(10 continued.)

$\$245000 : \$182000 :: \$9700 : \frac{\$9700 \times 182000}{245000}$

$= \$7205 \cdot 71\frac{3}{7} =$ A's share.

$\$245000 : \$55000 :: \$9700 : \frac{\$9700 \times 55000}{245000}$

$= \$2177 \cdot 55\frac{5}{49} =$ B's share.

$\$245000 : \$8000 :: \$9700 : \frac{\$9700 \times 8000}{245000}$

$= \$316 \cdot 73\frac{33}{49} =$ C's share.

Exercise 74.

(1)

From 70 cents the selling price
Take $62\frac{1}{2}$ cents the buying price

The remainder $7\frac{1}{2}$ cents = the gain per yard
$7\frac{1}{2}$ cents $\times$ 209 = \$15·67½ = whole gain.

(2)

From \$1·42 the selling price
Take \$1·29 the buying price

The remainder \$0·13 = the gain per bushel
\$0·13 $\times$ 8900 = \$1157 = the whole gain.

(3)

From 16 cents the buying price
Take $12\frac{1}{2}$ cents the selling price

The remainder $3\frac{1}{2}$ cents = the loss per cwt.
$3\frac{1}{2}$ cents $\times$ 780 = \$27·30 = the whole loss.

(4)

From $5·47 the selling price
Take $4·92 the buying price

The remainder $0·55 = the gain per 1000.
$0·55 × 1142 = $628·10 = the whole gain.

(5)

17 cwt. 2 qrs. 11 lbs. = 1761 lbs.; also at $23 per cwt. it is 23 cents per lb.

From 23 cents the selling price
Take 18 cents the buying price

The remainder 5 cents = the gain per lb.
5 cents × 1761 = $88·05 = the whole gain.

(6)

$13·50 per cwt. = 13½ cents per lb.
From 13½ cents the selling price
Take 11 cents the buying price

The remainder 2½ cents = the gain per lb.
2½ cents × 1143 = $28·57½ = the whole gain.

(7)

From $17·43 the buying price
Take $12·94 the selling price

The remainder $4·49 = the loss per ton.
$4·49 × 63 = $282·87 = whole loss.

(8)

From $4·17 the selling price
Take $3·37½ the buying price

The remainder $0·79½ = the gain per sheep
$0·79½ × 47 = $37·36½ = whole gain.

Exercise 75.

(1)

I want to gain \$10 on \$100, or 10 cents on \$1.
Hence selling price \$1·10 × 293 = \$322·30.

(2)

\$17 per \$100 = 17 cents per \$1.
Hence selling price = \$1·17 × 890 = \$1041·30.

(3)

\$1·23 × 630 = \$774·90 = whole buying price.
\$8 per \$100 = 8 cents per \$1; \$1 — 8 cents = \$0·92.
Hence selling price = \$0·92 × 774·90 = \$712·908.

(4)

44 cents × 950 = \$418·00 = cost of whole.
\$33 per \$100 = 33 cents per \$1.
\$1·33 × 418 = \$555·94 = selling price.

(5)

\$5·22 × 411 = \$2145·42 = whole cost.
\$12·50 per \$100 = 12½ cents per \$1.
\$1·12½ × 2145·42 = \$2413·5975.

(6)

\$2·80 × 512 = \$1433·60 = whole buying price.
\$15 per \$100 = 15 cents per \$1; \$1 — 15 cents = \$0·85.
\$0·85 × 1433·60 = \$1218·56 = selling price.

(7)

7 cents × 64980 = \$4548·60 = whole buying price.
\$24 per \$100 = 24 cents per \$1.
\$1·24 × 4548·60 = \$5640·264 = selling price.

(8)

$\$5{\cdot}22 \times 908 = \$4739{\cdot}76 =$ buying price.

$\$1\frac{1}{2}$ per $\$100 = 1\frac{1}{2}$ cents per $\$1$; $\$1 - 1\frac{1}{2}$ cents $= \$0{\cdot}98\frac{1}{2}$.

$\$0{\cdot}98\frac{1}{2} \times 4739{\cdot}76 = \$4668{\cdot}6636 =$ selling price.

EXERCISE 76.

(1)

$\$26{\cdot}25 - \$24 = \$2{\cdot}25 =$ gain on $\$24$.

$$\$24 : \$100 :: \$2{\cdot}25 : \frac{\$2{\cdot}55 \times 100}{24} = 9\tfrac{3}{8} \text{ per cent.}$$

(2)

$\$17{\cdot}80 \times 279 = \$4966{\cdot}20 =$ whole buying price.

$\$5570 - \$4966{\cdot}20 = \$603{\cdot}80 =$ whole gain.

$$\$4966{\cdot}20 : \$100 :: \$603{\cdot}80 : \frac{603{\cdot}80 \times 100}{4966{\cdot}20}$$

$= 12\frac{3228}{24831} =$ gain per cent.

(3)

$\$2{\cdot}30 \times 212 = \$487{\cdot}60 =$ whole cost.

$\$600 - \$487{\cdot}60 = \$112{\cdot}40 =$ whole gain.

$$\$487{\cdot}60 : \$100 :: \$112{\cdot}40 : \frac{112{\cdot}40 \times 100}{487{\cdot}60}$$

$= 23\frac{83}{1219}$ per cent.

(4)

$\$7{\cdot}40 \times 93 = \$688{\cdot}20 =$ whole cost.

$\$688{\cdot}20 - \$651 = \$37{\cdot}20 =$ whole loss.

$$\$688{\cdot}20 : \$100 :: \$37{\cdot}20 : \frac{37{\cdot}20 \times 100}{688{\cdot}20}$$

$= 5\frac{465}{1147}$ per cent.

(5)

$\$93{\cdot}40 \times 205 = \$19147 =$ whole cost.

$\$20987 - \$19147 = \$1840 =$ whole gain.

$$\$19147 : \$100 :: \$1840 : \frac{1840 \times 100}{19147} = 9\tfrac{11677}{19147} \text{ per ct.}$$

(8)

$\$7400 - \$6250 = \$1150 =$ whole loss.

$$\$7400 : \$100 :: \$1150 : \frac{1150 \times 100}{7400} = 15\tfrac{39}{37} \text{ per cent.}$$

EXERCISE 77.

(1)

$\$100 + \$18 = \$118$

$$\$118 : \$100 :: \$1{\cdot}70 : \frac{\$1{\cdot}70 \times 100}{1{\cdot}18} = \$1{\cdot}44\tfrac{46}{59}$$

(2)

$\$100 + \$29 = \$129$

$$\$129 : \$100 :: \$324 : \frac{\$324 \times 100}{129} = \$251{\cdot}62\tfrac{78}{43}$$

(3)

$\$100 - \$11 = \$89$

$$\$89 : \$100 :: \$1780 : \frac{\$1780 \times 100}{89} = \$2000$$

$=$ whole buying price.

$\$2000 \div 356 = \$5{\cdot}61\tfrac{79}{89}$ per bushel.

(4)

$\$100 - \$14 = \$86$

$$\$86 : \$100 :: 8\tfrac{9}{10} \text{ cents} : \frac{8\frac{9}{10} \text{ cents} \times 100}{86}$$

$= 10\frac{14}{43}$ cents = buying price.

(5)

$\$100 + \$43 = \$143$

$$\$143 : \$100 :: \$9490 : \frac{\$9490 \times 100}{143} \quad \$6636{\cdot}36$$

= buying price.

(6)

$\$6{\cdot}72 \times {\cdot}20 = \$1{\cdot}344$ = commission on each barrel.

$$\$111 : 100 :: \$6{\cdot}72 : \frac{\$6{\cdot}72 \times 100}{111} = \$6{\cdot}05405$$

= original cost per barrel.

$\$6{\cdot}05405 + \$1{\cdot}344 = \$7{\cdot}39805$ = total cost per brl.

(7)

$\$100 + \$9 = \$109$

$$\$109 : \$100 :: \$145 : \frac{\$145 \times 100}{109} = \$133{\cdot}0275\frac{25}{109}$$

= buying price.

(8)

$\$100 + \$31 = \$131$

$$\$131 : \$100 :: \$12 : \frac{\$12 \times 100}{131} = \$9{\cdot}1603\frac{7}{131}$$

= buying price.

Exercise 78.

(1)

11 cents $\times$ 207 = \$22·77; \$22·77 $\div$ 34½
= \$45·54 $\div$ 69 = \$0·66.

(2)

10 cents $\times$ 293 = \$29·30 = price of eggs.
18 cents $\times$ 47 = \$ 8·46 = price of raisins.
14 cents $\times$ 9 = \$ 1·26 = " loaf sugar.
6 cents $\times$ 23 = \$ 1·38 = " rice.
\$8·46 + \$1·26 + \$1·38 = \$11·10 = price of raisins, sugar and rice.
\$29·30 — \$11·10 = \$18·20 = cost of nails.
\$18·20 $\div$ \$0·05 = 1820 $\div$ 5 = 364 lbs.

(3)

27 cents $\times$ 91 = \$24·57 = worth of figs.
\$24·57 $\div$ \$0·43 = 2457 $\div$ 43 = $57\frac{6}{43}$ yds.

(4)

\$33·70 $\times$ 9 = \$ 303·30 = worth of cows.
\$303·30 $\div$ 84 = \$3·61$\frac{1}{14}$ = price of a sheep.

(5)

\$1·73 $\times$ 98 = \$169·54 = worth of silk.
\$169·54 — \$14·20 = \$155·34 = worth of broad cloth.
\$155·34 $\div$ 23 = \$6·75$\frac{9}{23}$ = worth of cloth per yd.

(6)

\$4·90 per cent = $4\frac{9}{10}$ cents per lb.
$4\frac{9}{10}$ cents $\times$ 607 = \$29·743 = worth of pork.
\$29·743 $\div$ 409 = \$0·072$\frac{295}{409}$ = worth of cheese per lb.

(7)

$\$1{\cdot}35 \times 420 = \$567 =$ worth of wheat.

$\$567 - \$207{\cdot}50 = \$359{\cdot}50 =$ cost of flour.

$\$359{\cdot}50 \div 11983\frac{1}{3} = \$1078{\cdot}50 \div 35950 = \$0{\cdot}03$

$= 3$ cents per lb.

3 cents $\times 100 = \$3{\cdot}00 =$ cost of a cwt of flour.

(8)

11 cents $\times 423 = \$46{\cdot}53 =$ worth of sugar.

$\$46{\cdot}53 \div \$0{\cdot}23 = 4653 \div 23 = 202{\cdot}304\frac{8}{23}$ quarts.

EXERCISE 79.

(1)

$\$714{\cdot}93 \times \frac{1}{4} = £178{\cdot}7325 =$ £178 14s. $7\frac{1}{5}$d.

(2)

$\$914{\cdot}90 \times \frac{2}{5} = £365{\cdot}96 =$ £365 19s. $2\frac{2}{5}$d.

(3)

$\$611{\cdot}20 \times \frac{3}{10} = £183{\cdot}36 =$ £183 7s. $2\frac{2}{5}$d.

(4)

$\$43{\cdot}92 \times \frac{2}{5} = £17{\cdot}568 =$ £17 11s. $4\frac{8}{25}$d.

(5)

£293 17s. 4d. $=$ £293·8666; $£293{\cdot}86 \div \frac{1}{4} = \$1175{\cdot}463$.

(6)

£294 11s. $11\frac{1}{3}$d $=$ £294·597916; $£294{\cdot}597916 \div \frac{3}{8}$

$= \$785{\cdot}594$.

(7)

£247 2s. $5\frac{1}{4}$d. $=$ £247·121875 $\div \frac{7}{30} = \$1059{\cdot}09375$.

(8)

£89 11s. 10½d. = £89·59375 = £89·59375 ÷ ¼
= $358·37½.

(9)

$994·70 ÷ $4·867 = £204·3764 = £204 7s. 6¼d. +

(10)

$896·93 ÷ $4·867 = £184·28806 = £184 5s. 9d. +

(11)

$1020·11 ÷ $4·867 = £209·5972 = £209 11s. 11¼d +

(12)

$89·74 ÷ $4·867 = £18·4384 = £18 8s. 9d. +

(13)

£29 14s. 11¼ = £29·746875 × 4·867 = $144·778039625.

(14)

£294 16s. 2½d. = £294·810416 × 4·867 = $1434·84229+

(15)

£411 16s. 7d. = £411·82916 × 4·867 = $2004·3725.

(16)

£843 9s. 0d. = £843·45 × 4·867 = $4105·17115.

(17)

£294 11s. 10d. = £294·5916; £294·5916 ÷ ⅜
= $785·577.

(18)

$2947·80 ÷ $4·867 = $605·6708 = £605 13s. 5d. +

(19)

$\$1291{\cdot}10 \times \frac{3}{8} = £516{\cdot}44 = £516\ 8s.\ 9\frac{3}{5}d.$

(20)

$£470\ 1\text{9}\ 8\frac{1}{4} = £470{\cdot}984375$; $£470{\cdot}984375 \times 4{\cdot}867$
$= \$2292{\cdot}28095 +$

EXERCISE 80.

(1)

$\frac{1}{11}$ of $77 = 7$; $7 \times 3 = 21 = \frac{3}{11}$ of 77; $21 \div 3 = 7$
$\therefore \frac{3}{11}$ of 77 is 7 times 3.

(2)

$\frac{1}{7}$ of $49 = 7$; $7 \times 4 = 28 = \frac{4}{7}$ of 49; $28 \div 5 = 5\frac{3}{5}$
$\therefore \frac{4}{7}$ of 49 is $5\frac{3}{5}$ times 5.

(3)

$\frac{1}{10}$ of $130 = 13$; $13 \times 9 = 117 = \frac{9}{10}$ of 130; $117 \div 7$
$= 16\frac{5}{7}$ $\therefore \frac{9}{10}$ of 130 is $16\frac{5}{7}$ times 7.

(4)

$\frac{1}{5}$ of $70 = 14$; $14 \times 2 = 28 = \frac{2}{5}$ of 70; $28 \div 9 = 3\frac{1}{9}$
$\therefore \frac{2}{5}$ of 70 is $3\frac{1}{9}$ times 9.

(5)

$\frac{1}{9}$ of $54 = 6$; $6 \times 8 = 48 = \frac{8}{9}$ of 54; $48 \div 12 = 4$
$\therefore \frac{8}{9}$ of 54 is 4 times 12.

(6)

If $72 = \frac{6}{11}$ of a number, $\frac{1}{11} = \frac{1}{6}$ of $72 = 12$; if $12 = \frac{1}{11}$,
$12 \times 11 = 132 =$ required number.

Then 132 is [illegible] many times 5? 132 is as many times 5
[illegible] 5 is contained times in 132.
$132 \div 5 = 26\frac{2}{5}$ $\therefore$ 72 is $\frac{6}{11}$ of $26\frac{2}{5}$ times 5.

(7)

If 121 is $\frac{11}{12}$ of a certain number, $\frac{1}{12}$ of that number will be $\frac{1}{11}$ of 121 which is 11; if 11 is $\frac{1}{12}$ of a certain number, 12 times 11 which is 132 is the required number.

132 is as many times 10 as 10 is contained times in 132 which is $13\frac{2}{5}$.

Therefore 121 is $\frac{11}{12}$ of $13\frac{2}{5}$ times 10.

(8)

If 48 is $\frac{8}{9}$ of a certain number, $\frac{1}{9}$ of that number will be $\frac{1}{8}$ of 48 which is 6.

If 6 is $\frac{1}{7}$ of a certain number, 8 times 6 or 48 will be the required number.

48 is as many times 7 as 7 is contained times in 48 which is $48 \div 7 = 6\frac{6}{7}$.

Therefore 48 is $\frac{8}{9}$ of $6\frac{6}{7}$ times 7.

(9)

If 78 is $\frac{6}{11}$ of a certain number, $\frac{1}{11}$ of that number will be $\frac{1}{6}$ of 78 which is 13.

If 13 be $\frac{1}{11}$ of a certain number $13 \times 11 = 143$ will be that number.

143 is as many times 11 as 11 is contained times in 143 which is 13.

Therefore 78 is $\frac{6}{11}$ of 13 times 11.

(10)

$\frac{1}{5}$ of 25 is 5; then 5 is $\frac{6}{7}$ of what number?

If 5 be $\frac{6}{7}$ of a number, $\frac{1}{7}$ of that number will be $\frac{1}{6}$ of 5 which is $\frac{5}{6}$.

If $\frac{5}{6}$ be $\frac{1}{7}$ of a number, that number will be $\frac{5}{6} \times 7 = \frac{35}{6} = 5\frac{5}{6}$.

Therefore $\frac{1}{5}$ of 25 is $\frac{6}{7}$ of $5\frac{5}{6}$.

(11)

$\frac{6}{7}$ of 42 = 6 times $\frac{1}{7}$ of 42 = 6 × 6; then 36 is $\frac{5}{11}$ of what number?

If 36 be $\frac{5}{11}$ of a number, $\frac{1}{11}$ of that number will be $\frac{1}{5}$ of 36 which is $7\frac{1}{5}$.

If $7\frac{1}{5}$ be $\frac{1}{11}$ of a number, that number will be 11 times $7\frac{1}{5}$ which is $79\frac{1}{5}$.

Therefore $\frac{6}{7}$ of 42 is $\frac{5}{11}$ of $79\frac{1}{5}$.

(12)

$\frac{7}{9}$ of 81 = 7 times $\frac{1}{9}$ of 81 = 7 times 9 = 63; then 63 is $\frac{3}{10}$ of what number?

If 63 be $\frac{3}{10}$ of a number, $\frac{1}{10}$ of that number will be $\frac{1}{3}$ of 63 which is 21.

If 21 be $\frac{1}{10}$ of a number, that number will be 10 times 21 which is 210.

Therefore $\frac{7}{9}$ of 81 is $\frac{3}{10}$ of 210.

(13)

$\frac{4}{11}$ of 99 = 4 times $\frac{1}{11}$ of 99 = 4 times 9 = 36; then 36 is $\frac{4}{5}$ of what number?

If 36 be $\frac{4}{5}$ of a number, $\frac{1}{5}$ of that number will be $\frac{1}{4}$ of 36 which is 9.

If 9 be $\frac{1}{5}$ of a number, that number will be 5 times 9 which is 45.

Therefore $\frac{4}{11}$ of 99 is $\frac{4}{5}$ of 45.

(14)

If 8 cows give 44 lbs. 1 cow will give $\frac{1}{8}$ of 44 lbs. which is $5\frac{1}{2}$ lbs.

If 1 cow gives $5\frac{1}{2}$ lbs. 11 cows will give 11 times $5\frac{1}{2}$ which is $60\frac{1}{2}$ lbs.

Therefore if 8 cows give 44 lbs. 11 cows will give $60\frac{1}{2}$ lbs.

(15)

If 9 barrels cost \$27, 1 barrel will cost $\frac{1}{9}$ of \$27 which is \$3.

If 1 barrel costs \$3, 23 barrels will cost 23 times \$3 which is \$69.

Therefore if \$27 pay for 9 barrels, 23 barrels will cost \$69.

(16)

If 13 days' work cost \$7·80, 1 day's work will cost $\frac{1}{13}$ of \$7·80 which is 60 cents.

\$19·80 will pay for as many days' work as 60 cents is contained times in \$19·80 which is \$19·80 ÷ \$0·60 = 1980 ÷ 60 = 33.

Therefore if 13 days' work cost \$7·80, \$19·80 will pay for 33 days' work.

(17)

If A and B can do the work in 4 days, in 1 day they will together do $\frac{1}{4}$ of it, and if A alone can do the work in 9 days, in 1 day he can do $\frac{1}{9}$ of it.

Then $\frac{1}{4} - \frac{1}{9} = \frac{9}{36} - \frac{4}{36}$ = the part B can do in 1 day, and he will require as many times 1 day to finish it as $\frac{5}{36}$ is contained times in the whole, i. e. $1 \div \frac{5}{36} = \frac{36}{5} = 7\frac{1}{5}$ days.

(18)

If A can do the whole in 10 days, in 1 day he can do $\frac{1}{10}$ of it; if B can do the whole in 7 days in 1 day he can do $\frac{1}{7}$ of it; and if C can do the whole in 12 days in 1 day he can do $\frac{1}{12}$ of it.

Therefore together they will do $\frac{1}{10} + \frac{1}{7} + \frac{1}{12} = \frac{137}{420}$ of it in 1 day, and to finish it they will require as many times 1 day as $\frac{137}{420}$ is contained times in the whole, i. e. $1 \div \frac{137}{420} = \frac{420}{137} = 3\frac{9}{137}$ days.

(19)

A, B, and C can together do the work in 15 days, therefore in 1 day they would do $\frac{1}{15}$ of it.

A, working alone, can finish it in 35 days and therefore in 1 day he can do $\frac{1}{35}$ of it.

B, working alone, can do the work in 42 days, hence in 1 day he can do $\frac{1}{42}$ of it.

Therefore B and C, working together, can do $\frac{1}{35} + \frac{1}{42} = \frac{13}{210}$ of it in 1 day, and A can do $\frac{1}{15} - \frac{11}{210} = \frac{3}{210} = \frac{1}{70}$ of it in 1 day.

And he would require as many times 1 day to finish it as $\frac{1}{70}$ is contained times in the whole, i. e. $1 \div \frac{1}{70} = 70$ days.

(20)

$\frac{3}{7}$ of $\frac{3}{8}$ of $\frac{28}{30} = \frac{1}{10}$; \$10·50 is $\frac{1}{10}$ of the price of the cow and hence the price is 10 times \$10·50 which is \$105.

(21)

$\frac{3}{3}$ of $\frac{2}{4}$ of $\frac{6}{25}$ of $\frac{10}{27} = \frac{2}{15}$; \$1000 is $\frac{2}{15}$ of the price hence $\frac{1}{2}$ of \$1000 which is \$500 is $\frac{1}{15}$ of the price and hence the price is 15 times \$500 which is \$7500.

(22)

If 1 bush. of wheat be worth \$1·40, 27 bush. will be worth \$1·40 × 27 = \$37·80 and if 1 bush. be worth \$1·10, 11 bush. will be worth \$1·10 × 11 = \$12·10 and will be worth \$37·80 + \$12·10, i. e. \$49·90.

If 38 bush. be worth \$49·90, 1 bush. will be worth $\frac{1}{38}$ of \$49·90 which is \$49·90 ÷ 38 = \$1·31$\frac{6}{19}$.

(23)

15	gal.	at	$4·80	= $72·00
12	"	at	$3·70	= 44·40
10	"	at	$2·90	= 29·00
37				$145·40

Mixture = 37 gal. which is worth $145·40

If 37 gal. be worth $145·40, 1 gal. will be worth $\frac{1}{37}$ of $145·40 which is $145·40 ÷ 37 = $3·92$\frac{36}{37}$.

(24)

$\frac{1}{4} + \frac{2}{7} + \frac{1}{6} = \frac{20}{21}$; if $\frac{20}{21}$ of my sheep number 80, $\frac{1}{21}$ will number the $\frac{1}{20}$ of 80 which is 4.

If 4 be $\frac{1}{21}$ of my sheep, the whole number will be 21 times 4 which is 84.

(25)

$\frac{1}{4} + \frac{2}{5} = \frac{13}{20}$ = part of the post in ground and in water.

Therefore $\frac{20}{20} - \frac{13}{20} = \frac{7}{20}$ — part above water = 9 feet by question.

If $\frac{7}{20} = 9$ ft., $\frac{1}{20}$ will equal $\frac{1}{7}$ of 9 ft. = $1\frac{2}{7}$ ft., and if $\frac{1}{20}$ of the post is equal to $1\frac{2}{7}$ ft., the whole must equal 20 times $1\frac{2}{7}$ ft. which is $25\frac{5}{7}$ ft.

(26)

Since A walks 3 miles and B $3\frac{1}{2}$ miles per hour and they walk in opposite directions they approach one another at the rate of $6\frac{1}{2}$ miles per hour.

$100 ÷ 6\frac{1}{2} = 15\frac{5}{13}$ hrs. = time before they meet.

Since B walks 3 miles per hour he will walk $3 \times 15\frac{5}{13} = 46\frac{2}{13}$ miles before he meets A, or the latter will walk $3\frac{1}{2} \times 15\frac{5}{16} = 53\frac{11}{13}$ miles before he meets B.

(27)

Since they travel in the same direction A at the rate of 5 miles per hour, and B at the rate of $3\frac{1}{2}$ miles per hour, A will gain on B at the rate of $1\frac{1}{2}$ miles per hour, and he has to gain the whole circumference of the island or 60 miles.

Hence time that elapses before A overtakes B will be $60 \div 1\frac{1}{2} = 40$ hours and distance travelled by A, will be $40 \times 5 = 200$ miles.

(28)

$\frac{1}{3} + \frac{1}{4} + \frac{1}{5} + \frac{1}{6} = \frac{57}{60}$; what number is that of which $\frac{57}{60}$ is 104?

If $\frac{57}{60}$ be 104, $\frac{1}{60}$ will $\frac{1}{57}$ of 104 which is $\frac{104}{57}$; and if $\frac{1}{60}$ be $\frac{104}{57}$ the number required will be $\frac{104}{57} \times 60 = 109\frac{9}{19}$.

(29)

If $\frac{3}{4} = \frac{8}{11}$ and 2, the difference between $\frac{3}{4}$ and $\frac{8}{11}$ must be 2; i. e. $\frac{3}{4} - \frac{8}{11} = 2$, or $\frac{1}{44} = 2$.

If $\frac{1}{44}$ of a number be 2, the number itself will be 44 times 2, which is 88.

(30)

$\frac{1}{2}$ of $\frac{4}{5}$ of $\frac{7}{9} = \frac{14}{45}$; $11\frac{1}{9}$ is $\frac{14}{45}$ of the last product, hence the product in question is $\frac{56}{5} \div \frac{14}{45} = \frac{56}{5} \times \frac{45}{14} = 36$.

$36 \div 3 = 12 =$ sum spoken of; $12 - 7 = 5 =$ 2nd quotient.

$5 \times 11 = 55 =$ remainder spoken of.

$55 + 5 = 60 = \frac{3}{8}$ of the 1st quotient; hence 1st quotient $= \frac{60 \times 8}{3} = 160$.

$160 \times 4 = 640$.

Exercise 81.

(1)

$$17^2 = 17 \times 17 = 289.$$

(2)

$$23^3 = 23 \times 23 \times 23 = 12167.$$

(3)

$$279^2 = 279 \times 279 = 77841.$$

(4)

$$81^3 = 81 \times 81 \times 81 = 531441.$$

(5)

$$6^4 = 6 \times 6 \times 6 \times 6 = 1296.$$

(6)

$$5^5 = 5 \times 5 \times 5 \times 5 \times 5 = 3125.$$

(7)

$$4^6 = 4 \times 4 \times 4 \times 4 \times 4 \times 4 = 4096.$$

(8)

$$3^7 = 3 \times 3 \times 3 \times 3 \times 3 \times 3 \times 3 = 2187.$$

(9)

$$2^8 = 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 = 256.$$

(10)

$$3^9 = 3 \times 3 \times 3 \times 3 \times 3 \times 3 \times 3 \times 3 \times 3 = 19683.$$

(11)

$$7^3 = 7 \times 7 \times 7 = 343.$$

(12)

$$11^4 = 11 \times 11 \times 11 \times 11 = 14641.$$

(13)

$9^6 = 9 \times 9 \times 9 \times 9 \times 9 \times 9 = 531441.$

(14)

$(\frac{2}{5})^5 = \frac{2}{5} \times \frac{2}{5} \times \frac{2}{5} \times \frac{2}{5} \times \frac{2}{5} = \frac{32}{3125}.$

(15)

$1225^2 = 1225 \times 1225 = 1500625.$

(16)

$4837^2 = 4837 \times 4837 = 23396569.$

(17)

$(4\frac{1}{4})^3 = (\frac{17}{4})^3 = \frac{17}{4} \times \frac{17}{4} \times \frac{17}{4} = \frac{4913}{64} = 76\frac{49}{64}.$

(18)

$29^3 \ldots 29 \times 29 \times 29 = 24389.$

(19)

$(2\frac{2}{3})^4 = (\frac{8}{3})^4 = \frac{8}{3} \times \frac{8}{3} \times \frac{8}{3} \times \frac{8}{3} = \frac{4096}{81} = 50\frac{46}{81}.$

(20)

$3^{10} = 3 \times 3 \times 3 \times 3 \times 3 \times 3 \times 3 \times 3 \times 3 \times 3 = 59049.$

EXERCISE 82.

(1)

$$\begin{array}{r|l} 1296 & 36 \\ 9 & \\ \hline 66)396 & \\ 396 & \end{array}$$

(2)

$$\begin{array}{r|l} 3969 & 63 \\ 36 & \\ \hline 123)369 & \\ 369 & \end{array}$$

(3)

15876(126
1
22)58
44
246)1476
1876

(4)

53361(231
4
43)133
129
461)461
461

(5)

142884(378
9
67)528
469
748)5984
5984

(6)

998001(999
81
189)1880
1701
1989)17901
17901

(7)

·244036(·494
16
89)840
801
984)3936
3936

(8)

·395641(·629
36
122)356
244
1249)11241
11241

(9)

```
  756·25)27·5
  4
  ------
47)356
   329
   ------
54·5)2725
     2725
```

(10)

```
     11397·4849(106·759
     1
     -----
206)1397
    1236
    -----
212·7)161·48
      148·89
      ------
213·45)12·5949
       10·6725
       -------
213·509)1·922400
        1·921581
        --------
         ·000819
```

(11)

```
      98123·478910(313·246
      9
      --
  61)81
     61
     --
623)2023
    1869
    ----
626·2)154·47
      125·24
      ------
626·44)29·2389
       25·0576
       -------
626·486)4·181310
        3·758916
        --------
         ·422394
```

(12)

```
        6712914·23(2590·929
        4
        --
     45)271
        225
        ---
    509)4629
        4581
        ----
  5180·9)4814·23
         4662·81
         -------
  5181·82)151·4200
          103·6364
          --------
  5181·849)47·783600
           46·636641
           ---------
            1·146959
```

(13)

$$
\begin{array}{l}
918767)958\cdot523 \\
\quad 81 \\
\hline
185)1087 \\
\quad 925 \\
\hline
1908)16267 \\
\quad 15264 \\
\hline
1916\cdot5)1003\cdot00 \\
\quad 958\cdot25 \\
\hline
1917\cdot02)44\cdot7500 \\
\quad 38\cdot3404 \\
\hline
1917\cdot043)6\cdot409600 \\
\quad 5\cdot751129 \\
\hline
\quad \cdot658471
\end{array}
$$

(14)

$$
\begin{array}{l}
429\tfrac{3}{4} = 429\cdot75(20\cdot7304 \\
\quad 4 \\
\hline
40\cdot7)29\cdot75 \\
\quad 28\cdot49 \\
\hline
41\cdot43)1\cdot2600 \\
\quad 1\cdot2429 \\
\hline
41\cdot4604)\cdot01710000 \\
\quad \cdot01658416 \\
\hline
\quad \cdot00051584
\end{array}
$$

(15)

$$\sqrt{\frac{9}{16}} = \frac{\sqrt{9}}{\sqrt{16}} = \frac{3}{4}; \quad \sqrt{\frac{36}{81}} = \frac{\sqrt{36}}{\sqrt{81}} = \frac{6}{9};$$

$$\sqrt{\frac{121}{169}} = \frac{\sqrt{121}}{\sqrt{169}} = \frac{11}{13}; \quad \sqrt{\frac{81}{400}} = \frac{\sqrt{81}}{\sqrt{400}} = \frac{9}{20}.$$

(16)

$\frac{7}{11} = 0 \cdot 6363636363\ldots$

$0 \cdot 63636363(\cdot 7977$
$\cdot 49$

$1 \cdot 49)1463$
1341

$1 \cdot 587)12263$
11109

$1 \cdot 5947)115463$
111629

3834

$\frac{8}{17} = 0 \cdot 52941176\ldots$

$0 \cdot 52941176(\cdot 7276$
49

$1 \cdot 42)394$
284

$1 \cdot 447)11011$
10129

$1 \cdot 4546)88276$
87276

1000

(17)

$428\frac{3}{7} = 428 \cdot 428571\ldots$

$428 \cdot 428571(20 \cdot 698$
4

$40 \cdot 6)28 \cdot 42$
$24 \cdot 36$

$41 \cdot 29)4 \cdot 0685$
$3 \cdot 7161$

$41 \cdot 388)\cdot 352471$
$\cdot 331104$

$\cdot 021367$

(18)

$629\frac{4}{5} = 629 \cdot 8$

629·800000(25·095
4
45)229
225
50·09)4·8000
4·5081
50·185)·291900
·250925
·040975

(19)

$1127896\frac{1}{4} = 1127896 \cdot 25$

1127896·250000(1062·024
1
206)1278
1236
2122)4296
4244
212402)52·2500
42·4804
2124044)9·769600
8·496176
1·273424

(20)

$$
\begin{array}{r}
\cdot\quad\cdot\quad\cdot\quad\cdot\quad\cdot\quad\cdot \\
213798\cdot123700(462\cdot383 \\
16 \\
\hline
86)537 \\
516 \\
\hline
922)2198 \\
1844 \\
\hline
924\cdot3)354\cdot12 \\
277\cdot29 \\
\hline
924\cdot68)76\cdot8337 \\
73\cdot9744 \\
\hline
924\cdot763)2\cdot859300 \\
2\cdot774289 \\
\hline
\cdot085011
\end{array}
$$

EXERCISE 83.

(1)

$$
\begin{array}{rrr|r}
 & & & 32768(32 \\
 & & & 27 \\
\hline
3^2 = 9 \times & 300 = & 2700 & 5768 \\
3 \times 2 = 6 \times & 30 = & 180 & \\
 & 2^2 = & 4 & \\
\hline
 & & 2884 & 5768 \\
\hline
\end{array}
$$

(2)

$$
\begin{array}{rl|l}
 & & 658503(87 \\
 & & 512 \\
\hline
8^2 = 64 \times 300 = & 19200 & 146503 \\
8 \times 7 = 56 \times 30 = & 1680 & \\
7^2 = & 49 & \\
\hline
 & 20929 & 146503 \\
\hline
\end{array}
$$

(3)

$$
\begin{array}{rl|l}
 & & 13824(24 \\
 & & 8 \\
\hline
2^2 = 4 \times 300 = & 1200 & 5824 \\
2 \times 4 = 8 \times 30 = & 240 & \\
4^2 = & 16 & \\
\hline
 & 1456 & 5824 \\
\hline
\end{array}
$$

(4)

$$
\begin{array}{rl|l}
 & & 250047 (63 \\
 & & 216 \\
\hline
6^2 = 36 \times 300 = & 10800 & 34047 \\
6 \times 3 = 18 \times 30 = & 540 & \\
3^2 = & 9 & \\
\hline
 & 11349 & 34047 \\
\hline
\end{array}
$$

(5)

970299 (99
729

$9^2 = 81 \times 300$	=	24300	241299
$9 \times 9 = 81 \times 30$	=	2430	
9^2	=	81	
		26811	241299

(6)

1953125 (125
1

$1^2 = 1 \times 300$	=	300	953
$1 \times 2 = 2 \times 30$	=	60	
2^2	=	4	
		364	728
$12^2 = 144 \times 300$	=	43200	225125
$12 \times 5 = 60 \times 30$	=	1800	
5^2	=	25	225125
		45025	

(7)

15813251 (251
8

$2^2 = 4 \times 300$	=	1200	7813
$2 \times 5 = 10 \times 30$	=	300	
5^2	=	25	
		1525	7625
$25^2 = 625 \times 300$	=	187500	188251
$25 \times 1 = 25 \times 30$	=	750	
1^2	=	1	
		188251	188251

(8)

48228544 (364
27

$3^2 = 9 \times 300$	=	2700	21228
$3 \times 6 = 18 \times 30$	=	540	
6^2		36	
		3276	19656
$36^2 = 1296 \times 300$	=	388800	1572544
$36 \times 4 = 144 \times 30$	=	4320	
4^2	=	16	
		393136	1572544

(9)

245314376 (626
216

$6^2 = 36 \times 300$	= 10800	29314
$6 \times 2 = 12 \times 30$	= 360	
2^2	= 4	
	11164	22328
$62^2 = 3844 \times 300$	= 1153200	6986376
$62 \times 6 = 372 \times 30$	= 11160	
6^2	= 36	
	1164396	6986376

(10)

686·128968 (8·82
512

$8^2 = 64 \times 300$	= 19200	174·128
$8 \times 8 = 64 \times 30$	= 1920	
8^2	= 64	
	21184	169·472
$88^2 = 7744 \times 300$	= 2323200	4·656968
$88 \times 2 = 176 \times 30$	= 5280	
2^2	= 4	
	2328484	4·656968

(11)

991026·973 (99·7
729

$9^2 = 81 \times 300$	=	24300	262026
$9 \times 9 = 81 \times 30$	=	2430	
9^2	=	81	
		26811	241299
$99^2 = 9801 \times 300$	=	2940300	20727·973
$99 \times 7 = 693 \times 30$	=	20790	
7^2	=	49	
		2961139	20727·973

(12)

·915498611 (·971
729

$9^2 = 81 \times 300$	=	24300	186498
$9 \times 7 = 63 \times 30$	=	1890	
7^2	=	49	
		26239	183673
$97^2 = 9409 \times 300$	=	2822700	2825611
$97 \times 1 = 97 \times 30$	=	2910	
1^2	=	1	
		2825611	2825611

(13)

$$\sqrt[3]{\frac{8}{27}} = \frac{\sqrt[3]{8}}{\sqrt[3]{27}} = \frac{2}{3};\quad \sqrt[3]{\frac{125}{1728}} = \frac{\sqrt[3]{125}}{\sqrt[3]{1728}} = \frac{5}{12};$$

$$\sqrt[3]{\frac{343}{729}} = \frac{\sqrt[3]{343}}{\sqrt[3]{729}} = \frac{7}{9};\quad \sqrt[3]{\frac{64}{125}} = \frac{\sqrt{64}}{\sqrt{125}} = \frac{4}{5}$$

(14)

$\frac{11}{12} = 0{\cdot}916666666$

			$\dot{\cdot}9\dot{1}6\dot{6}66\dot{6}66$ (·971
			729
$9^2 = 81 \times 300$	=	24300	187666
$9 \times 7 = 63 \times 30$	=	1890	
7^2	=	49	
		26239	183673
$97^2 = 9409 \times 300$	=	2822700	3993666
$97 \times 1 = 97 \times 30$	=	2910	
1^2	=	1	
		2825611	2825611
			·1168055

$\frac{9}{10} = {\cdot}9$

(Continued on next page.)

(14 continued.)

$\frac{9}{10} = \cdot 9$

		$\cdot 900000000$ ($\cdot 965$
		729
$9^2 = 81 \times 300$	$= 24300$	171000
$9 \times 6 = 54 \times 30$	$= 1620$	
6^2	$= 36$	
	25956	155736
$96^2 = 9216 \times 300$	$= 2764800$	15264000
$96 \times 5 = 480 \times 30$	$= 14400$	
5^2	$= 25$	
	2779225	13946125
		1317875

(15)

$\dot{9} = 1$ and $\sqrt[3]{1} = 1$

		$\cdot 100000000$ ($\cdot 464$
		64
$4^2 = 16 \times 300$	$= 4800$	36000
$4 \times 6 = 24 \times 30$	$= 720$	
6^2	$= 36$	
	5556	33336
$46^2 = 2116 \times 300$	$= 634800$	2664000
$46 \times 4 = 184 \times 30$	$= 5520$	
4^2	$= 16$	
	640336	2561344
		102656

(Continued on next page.)

(15 continued.)

$\cdot\dot{1} = \cdot 111111111 +$

$\cdot 11111111111\ (\cdot 4807$

64

47111

$4^2 = 16 \times 300 = 4800$

$4 \times 8 = 32 \times 30 = 960$

$8^2 = 64$

5824

46592

519111

$48^2 = 2304 \times 300 = 691200$

$480^2 = 230400 \times 300 = 69120000$

519111111

$480 \times 7 = 3360 \times 30 = 100800$

$7^2 = 49$

69220849

484545943

34565168

(16)

427986·714300 (75·36
343

$7^2 = 49 \times 300$	= 14700	84986
$7 \times 5 = 35 \times 30$	= 1050	
5^2	= 25	
	15775	78875
$75^2 = 5625 \times 300$	= 1687500	6111·714
$75 \times 3 = 225 \times 30$	= 6750	
3^2	9	
	1694259	5082·777
$753^2 = 567009 \times 300$	= 170102700	1028·937300
$753 \times 6 = 4318 \times 30$	= 129540	
6^2	= 36	
	170232276	1021·393656
		7·543664

(17)

$816\frac{3}{5} = 816{\cdot}4$

816·400000000 (9·346
729

$9^2 = 81 \times 300$ = 24300		87·400
$9 \times 3 = 27 \times 30$ = 810		
3^2 = 9		
25119		75·357
$93^2 = 8649 \times 300$ = 2594700		12·043000
$93 \times 4 = 372 \times 30$ = 11160		
4^2 = 16		
2605876		10·423504
$934^2 = 872356 \times 300$ = 261706800		1·619496000
$934 \times 6 = 5604 \times 30$ = 168120		
6^2 = 36		
261874956		1·571249736
		48246264

(18)

$$917167\tfrac{4}{11} = 917167{\cdot}363636363 + \dot{9}\dot{1}\dot{7}\dot{1}\dot{6}\dot{7}\cdot\dot{3}\dot{6}\dot{3}\dot{6}\dot{3}\dot{6}\dot{3}\dot{6}\dot{3}$$

729

$9^2 = 81 \times 300 =$	24300	188167
$9 \times 7 = 63 \times 30 =$	1890	
$7^2 =$	49	
	26239	183673
$97^2 = 9409 \times 300 =$	2822700	4494·363
$97 \times 1 = 97 \times 30 =$	2910	
$1^2 =$	1	
	2825611	2825·611
		1668·752636
$971^2 = 942841 \times 300 =$	282852300	
$971 \times 5 = 4855 \times 30 =$	145650	
$5^2 =$	25	
	282997975	1414·989875
		253·762761363
$9715^2 = 94381225 \times 300 =$	28314367500	
$9715 \times 8 = 77720 \times 30 =$	2331600	
$8^2 =$	64	
	28316699164	226·531433312
		27·231328051

(19)

$8111471\frac{9}{13} = 8111471{\cdot}692307$

8111471·692307 (200·92

8

$2^2 = 4 \times 300$	= 12000000	111471·692
$200 \times 9 = 1800 \times 30$	= 54000	
$9^2 =$	81	
	12054081	108486·729
		2984·963307
$2009^2 = 4036081 \times 300$	= 1210824300	
$2009 \times 2 = 4018 \times 30$	= 120540	
$2^2 =$	4	
	1210944844	2421·889688
		563·073619

(20)

$27\frac{3}{4} = 27{\cdot}75.$

		$27{\cdot}750000000000(3{\cdot}0275$
		27
$3^2 = 9 \times 300$	$= 270000$	$\cdot 750000$
$30 \times 2 = 60 \times 30 =$	1800	
$2^2 =$	4	
	271804	$\cdot 543608$
$302^2 - 91204 \times 300 =$	27361200	
$302 \times 7 = 2114$		206392000
$\times 30 =$	63420	
$7^2 =$	49	
	27424669	191972683
$3027^2 = 9162729$		
$\times 300 =$	2748818700	14419317000
$3027 \times 5 = 15135$		
$\times 30 =$	454050	
$5^2 =$	25	
	2749272775	13746363875
		672953125

EXERCISE 84.

(1)

$\$7994{\cdot}70 \div 29 = \$275{\cdot}67\frac{27}{29}.$

(2)

Greater minus difference = the less.

$249 - 127 = 122.$

(3)

£294 × 400 = 117600
6s × 20 = 120
4½d = 18 far. × 5 ÷ 12 = 7½

£294 6s 4½d = $1177·27½

$1177·27½ ÷ ·9 = $1177·27½ ÷ 1 = $1177·27½.

(4)

$429·80 × ·29 = $124·642
$429·80 − $124·642 = $305·158
$305·158 ÷ $10·20 = $305158 ÷ $10200 = $29·916 +

(5)

½ of ⅞ of 4¼ = ½ × ⅞ × 17/4 = 51/16
3¾ + 4 9/11 + 51/16 + ⅜ − 5⅞ = 3/4 + 4 + ¾ + ⅜ + 51/16 + ⅜ − 5⅞
= 6¾ + 9/11 + 51/16 + ⅜ − 5⅞ = (6⅜ − 5⅞) + 9/11 + 51/16 + ⅜
= ⅞ + 9/11 + 51/16 + ⅜ = 3885/3080 + 3520/3080 + 3080/3080 + 1320/3080
= 8805/3080 = 3 165/3080 = 3 33/154.

(6)

$943·70 × ·095 = $89·6515 = int. for 1 year at 9½ per cent.
$89·6515 × 11·2 = $1004·0968 = int. for 11·2 years at 9½ per cent.

(7)

·7̇ = 7/9; ·4̇2̇ = (42 − 4)/90 = 38/90 = 19/45; ·2̇3̇5̇7̇ = (2357 − 23)/9900

2334/9900 = 389/1650; ·8̇7̇6̇ = 876/999 = 292/333.

(8)

$28 on $100 = 28 cents on $1.
$1·28 × 2916 = $3732·48 = selling price for the whole.
$3732·48 ÷ 729 = $5·12 = selling price per barrel.

(9)

$\frac{3}{5}$ of $\frac{4}{9}$ of $\frac{3}{7}$ of $63 = \frac{3}{5} \times \frac{4}{9} \times \frac{3}{7} \times \frac{63}{1} = 8$; then 8 is $\frac{3}{5}$ of how many times 8?

If 8 is $\frac{3}{5}$ of a certain number, $\frac{1}{5}$ of that number will be $\frac{1}{3}$ of 8, which is $\frac{8}{3}$.

If $\frac{8}{3}$ is $\frac{1}{5}$ of a certain number, that number will be 5 times $\frac{8}{3}$, which is $\frac{40}{3}$ or $4\frac{2}{3}$.

Then $4\frac{2}{3} \div 8 = \frac{5}{9}$.

Therefore 8 is $\frac{3}{5}$ of $\frac{5}{9}$ times 8.

(10)

		86172·191300000(44·169
		64
$4^2 = 16 \times 300$	$= 4800$	22172
$4 \times 4 = 16 \times 30$	$= 480$	
$4^2 =$	16	
	5296	21184
$44^2 = 1936 \times 300 =$	580800	988191
$44 \times 1 = 44 \times 30 =$	1320	
$1^2 =$	1	
	582121	582121
$441^2 = 194481$		
$\times 300 =$	58344300	406070300
$441 \times 6 = 2646$		
$\times 30 =$	79380	
6^2	36	
	58423716	350542296
$4416^2 = 19501056$		
$\times 300 =$	5850316800	55528004000
$4416 \times 9 = 39744$		
$\times 30 =$	1192320	
$9^2 =$	81	
	5851509201	52663582809
		2864421191

(11)

$$\begin{array}{r} \$376951 \\ 279404 \\ 19592 \\ 38936 \\ \hline \$714883 \end{array}$$

(12)

lbs.	oz.	dwt.	grs.		lbs.	oz.	dwt.	grs.
27	4	6	17	× 9½ =	259	11	3	17½
			10					
273	7	7	2	× 2 =	547	2	14	4
			10					
2736	1	10	20	× 6 =	16416	9	5	0
					17223	11	2	21½

(13)

$\frac{16}{48} = \frac{1}{3}$, dividing each term by 16; $\frac{121}{847} = \frac{1}{7}$ dividing both terms by 121.

$\frac{28512}{71280} = \frac{3168}{7920} = \frac{352}{880} = \frac{32}{80} = \frac{8}{20} = \frac{2}{5}$, dividing in succession by 7, by 9, by 11, by 4, and by 4.

$\frac{19691}{25762} = \frac{19691}{25762}$ i. e. the terms have no common measure.

(14)

·714625 miles.

8

5	·717000	fur.
	40	
28	·680000	
	5½	
3	·740000	
	3	
2	·220000	
	12	
2	·640000	

5 fur. 28 per. 3 yds. 2 ft. $2\frac{16}{25}$ in.

(15)

$$90\cdot478 \div 002693 = 90478000 \div 2693 = 33597\cdot4749 +$$

(16)

$$1\tfrac{1}{13} : \tfrac{7}{15} :: \$6294\tfrac{3}{11} : \$6294\tfrac{3}{11} \times \tfrac{7}{15} \div \tfrac{11}{13}$$

$$= \$6294\tfrac{3}{11} \times \tfrac{7}{15} \times \tfrac{13}{11} = \frac{\$69237 \times 7 \times 13}{11 \times 15 \times 11} = \frac{\$6300567}{1815}$$

$$= \$3471\cdot38\tfrac{82}{121}.$$

(17)

914 lbs. 7 oz. 5 drs. at $11·49 per lb.

4 oz.	$\frac{1}{4}$	$11·49
		914
		10501·86
2 oz.	$\frac{1}{8}$	2·87$\frac{1}{4}$
1 oz.	$\frac{1}{2}$	1·43$\frac{5}{8}$
4 drs.	$\frac{1}{4}$	·71$\frac{13}{16}$
1 dr.	$\frac{1}{4}$	·17$\frac{61}{64}$
		·04$\frac{125}{256}$
		$10507 11$$\frac{33}{256}$

(18)

$1100 × ·07 = $77 = interest for 1 year at 6 per cent.

6 mos.	$\frac{1}{2}$	$77
		38·50 = int. for 6 mos.
3 days	$\frac{1}{60}$	·64$\frac{2}{3}$ = int. for 3 dys.
		$39·14$$\frac{2}{3}$ = b'nk. dis. 6 ms.

Interest of $1 for 6 mos. at 7 per cent. = $0·035; hence amount of $1 for given time and rate = $1·035.

$1100 ÷ $1·035 = $1100000 ÷ $1035 = $1062·80193 = present worth.

$1100 — $1062·80193 = $37·19807 = true discount.

(19)

A, B, and C can do it in 10 days ∴ in 1 day they can do $\frac{1}{10}$ of it. A, working alone, can do it in 28 days ∴ in 1 day he can do $\frac{1}{28}$ of it. C, working alone, can do it in 32 days ∴ in 1 day he can do $\frac{1}{32}$ of it. Therefore A and C working together can do $\frac{1}{28} + \frac{1}{32} = \frac{15}{224}$ of it in 1 day. Hence B can do $\frac{1}{10} - \frac{15}{224} = \frac{37}{1120}$ of it in 1 day; and to finish the whole work he would require as many times 1 day as $\frac{37}{1120}$ is contained times in the whole, i. e. $1 \div \frac{37}{1120} = \frac{1120}{37} = 30\frac{10}{37}$ days.

(20)

$149\frac{3}{11} = 149 \cdot 27272727 +$

. . . . . .

149·27272727(12·2177

1

22)49

44

24·2)5·27

4·84

24·41)·4327

·2441

24·427)·188627

·170989

24·4347)1763827

1710429

53398

(21)

$2000 \div 6\frac{1}{2} = 4000 \div 13 = 307$ hrs. 41 min. $32\frac{4}{13}$ sec.

$= 1$ wk. 5 dys. 19 hrs. 41 min. $32\frac{4}{13}$ sec.

(22)

£219 8s. $11\frac{1}{4} = \$877 \cdot 78\frac{3}{4}$.

$\frac{2}{5}$ of $4\frac{1}{2}$ of $\frac{5}{7}$ of $\frac{1}{3\frac{1}{2}}$ of $24\frac{1}{2}$ times \$976·53

$$= \$976 \cdot 53 \times \frac{\cancel{2}}{\cancel{5}} \times \frac{\cancel{9}}{\cancel{2}} \times \frac{\cancel{5}}{\cancel{7}} \times \frac{\cancel{2}}{\cancel{7}} \times \frac{\cancel{49}^{7}}{\cancel{2}}$$

$= 976 \cdot 53 \times 9 = \$8788 \cdot 77.$

$\$8788 \cdot 77 - \$877 \cdot 78\frac{3}{4} = \$7910 \cdot 98\frac{1}{4}.$

(23)

978 a. 2 r. 1 per. 7 yds. = 18943909 quarter-yards.
2 a. 3 r. 27 per. 2 yds. = 172675 quarter-yards.
18943909 ÷ 172675 = 109·708 + times.

(25)

$$\frac{19}{4} \times \frac{11}{5} \times \frac{12}{9\frac{1}{2}} \times \frac{33}{17} = \frac{19}{4} \times \frac{11}{5} \times \frac{24}{19} \times \frac{33}{17}$$

$$= \frac{11 \times 6 \times 33}{5 \times 17} = \frac{2178}{85} = 2178 : 85$$

(26)

15013)27051(1
15013
2038)15013(7
14266
747)2038(2
1494
544)747(1
544
203)544(2
406
138)203(1
138
65

65)138(2
130
8)65(8
64
1)8(8
8

G. C. M. = 1

(27)

If 4 men can do the work in 56 $\frac{1}{4}$ hours, 1 man will require 4 times 56$\frac{1}{4}$ hours, i. e. 225 hours, and hence in 1 hour he would do $\frac{1}{225}$ of the whole work.

If 6 women can do the whole work in 56$\frac{1}{4}$ hours, 1 woman would require 6 times 56$\frac{1}{4}$ hours, i. e. 337$\frac{1}{2}$ hrs. and hence in 1 hour she would do $\frac{1}{337\frac{1}{2}} = \frac{2}{675}$ of the whole work, and consequently 2 women will do $\frac{4}{675}$ of the work in 1 hour.

8 boys can do the whole work in 56$\frac{1}{4}$ hours, 1 boy would require 8 times 56$\frac{1}{4}$ hours, i. e. 450 hours, and hence in 1 hour he would do $\frac{1}{450}$ of the whole work and consequently 5 boys would do 5 times $\frac{1}{450}$ which is $\frac{1}{90}$ of the whole work in 1 hour.

Then 1 man, 2 women, and 5 boys working together will do $\frac{1}{225} + \frac{4}{675} + \frac{1}{90} = \frac{29}{1350}$ of the whole work in 1 hr. and to finish it they would require as many times 1 hr. as $\frac{29}{1350}$ is contained times in the whole, i. e. $1 \div \frac{29}{1350} = \frac{1350}{29} = 46\frac{16}{29}$ hours.

(28)

$$\left.\begin{array}{r} 24 : 32 \\ 4 : 3\frac{1}{2} \\ 8 : 21 \\ 10 : 9 \end{array}\right| :: 400 : \text{Ans.} = \frac{400 \times 32 \times 3\frac{1}{2} \times 21 \times 9}{24 \times 4 \times 8 \times 10}$$

$$= 5 \times 3\frac{1}{2} \times 21 \times 3 = 1102\frac{1}{2} \text{ rods.}$$

(29)

£789 14s. 8$\frac{1}{2}$d. = £789·735416 × 4·867 = \$3843·6422+

·70 ÷ 4·867 = \$2984700 ÷ 4867 = £613·25251

= £613 5s. 0$\frac{1}{2}$d.

(30)

$800 × ·045 = $36 = Int. for 1st half-year.

Add 800

Sum = $836 = Amt. at and of 1st half-year.

$836 × ·045 = $37·62 = Int. for 2nd half-year.

Add 836·

Sum = $873·62 = Amt. at end of 2nd half-year.

$873·62 × ·045 = $39·3129 = Int. for 3rd half-year.

Add 873·62

Sum = $912·9329 = Amt. at end of 3rd hf-year.

$912·9329 × ·045 = $41·08198 = Int. for 4th hf-year.

Add 912·9329

Sum = $954·01488 Amt. required.

$954·01488 — $800 = $154·01488 = compound interest.

(31)

Toronto, $\frac{5000}{1600000} = \frac{5}{1600} = \frac{1}{320}$ 32 : 100 :: 1 : $\frac{100}{32} = 3\frac{1}{8}$.

Hamilton, $\frac{22000}{1600000} = \frac{22}{1600} = \frac{11}{800}$ = 800 : 100 :: 11 : $\frac{100 \times 11}{800} = \frac{11}{1} = 11\frac{3}{8}$.

Kingston, $\frac{15000}{1600000} = \frac{15}{1600} = \frac{3}{320}$; 320 : 100 :: 3 : $\frac{100 \times 3}{320} = \frac{300}{320} = \frac{15}{16}$.

(32)

Assu. 60 | 12..18..20..24..60..72..80..88..96..100

Assu. 6 | .. .. 6.. 4..22.. 8.. 5

.. .. 11..4..5

l. c. m. 60 × 6 × 11 × 4 × 5 = 79200

(34)

$\$7900 : \$2700 :: \$2470 : \frac{\$2470 \times 2700}{7900} = \$844{\cdot}17\frac{17}{79}$

= A's. Share.

$\$7900 : \$2300 :: \$2470 : \frac{\$2470 \times 2300}{7900} = \$719{\cdot}11\frac{31}{79}$

= B's Share.

$\$844{\cdot}17\frac{17}{79} + 719{\cdot}11\frac{31}{79} = \$1563{\cdot}29\frac{7}{79}$.

$\$2470 - \$1563{\cdot}29\frac{7}{79} = \$906{\cdot}70\frac{72}{79}$ = Cs' Share.

(35)

$\$1{\cdot}20 \times 796 = \$955{\cdot}20$; $\$1000 - \$955{\cdot}20 = \$44{\cdot}80$

= whole gain.

$\$955{\cdot}20 : \$100 :: \$44{\cdot}80 : \frac{\$44{\cdot}80 \times 100}{955{\cdot}20} = 4\frac{112}{597}$ p. cent.

(36)

144)9146714 in.

9)63518 ft. 86 in.

$30\frac{1}{4}$ | 7057 yds. 5 ft. 122 in.
4 | 4
121 | 28228 quarter-yds. 5 ft. 122 in.

233 per 35 qr. yds. 5 ft. 122 in.
= 233 per $8\frac{3}{4}$ yds. 5 ft. 122 in.
= 233 per 8 yds. 11 ft. 230 in.
= 233 per 9 yds. 3 ft. 86 in.
= 5 roods 33 per 9 yds. 3 ft. 86 in.
= 1a 1r 33 per 9 yds. 3 ft. 86 in.

(37)

$\$2967{\cdot}80 \times \frac{3}{10} = £890{\cdot}34 = £890\ 6s.\ 9\frac{3}{5}d.$

$£29\ 8s.\ 11\frac{1}{4}d. = £29{\cdot}447916 \div \frac{3}{8} = \$78{\cdot}527.$

(38)

17 bush. 1 pk. 1 gal. = 17·375 bush.

·14672 × 17·375 = 2 | ·54926 bush.

	4
2	·19704
	2
0	·39408
	4
1	·57632
	2
1	·15264

2 bush. 2 pk. 0 gal. 1 qt. 1·15264 pt.

(39)

$7149\frac{3}{11} = 7149{\cdot}272727$

		7149·272727(19·26
		1
$1^2 = 1 \times 300$ =	300	6149
$1 \times 9 = 9 \times 30$ =	270	
9^2 =	81	
	651	5859
$19^2 = 361 \times 300$ =	108300	290·272
$19 \times 2 = 38 + 30$ =	1140	
2^2 =	4	
	109444	218·888
$192^2 = 36864 \times 300$ =	11059200	71·384727
$192 \times 6 = 1152 \times 30$ =	34560	
6^2 =	36	
	11093796	66·562776
		4·821951

(40)

Since one pipe can fill the cistern in 40 and the other in 25 minutes, the one will fill $\frac{1}{40}$ and the other $\frac{1}{25}$ of it in 1 minute, and since the third pipe empties it in 30 minutes, in 1 minute it will empty $\frac{1}{30}$ of its contents. Then if all three pipes be left open, the part filled in 1 minute will be $(\frac{1}{40} + \frac{1}{25}) - \frac{1}{30} = \frac{15}{600} + \frac{24}{600} - \frac{20}{600} = \frac{19}{600}$. And to fill the cistern they will require as many times 1 minute as $\frac{19}{600}$ is contained times in the whole, i. e. $1 \div \frac{19}{600} = \frac{600}{19} = 31\frac{11}{19}$ minutes.

(41)

$71{\cdot}413 \div {\cdot}91467 = 7141300 \div 91467$

91467)7141300·(78·075

640269

738610

731736

687400

640269

471310

457335

13975

(42)

From 43 a. 2 r. 7 per. 0 yds.

Take 19 3 27 18

Diff. = 23 2 19 12¼ yds.

ac.	r.	per.	yds.	ft.	in.			ac.	r.	per.	yds.	ft.	in.
23	2	19	12	2	36	× 8 =		188	3	35	7	2	36
					10								
236	11	34	1	4	72	× 7 =		1653	1	38	10	4	72
					10								
2362	0	20	15	0	0	× 3 =		7086	1	21	14	6	108
							Sum =	8928	3	15	1¾	4	72
							=	8928	3	15	2	2	36

(43)

278 yds. 3 qrs. 1 na. 2 in.

4

1115 qrs.

4

4461 na.

$2\frac{1}{4}$

8924

$1115\frac{1}{4}$

$10039\frac{1}{4}$ inches

(44)

$\frac{2}{7}$ of $3\frac{1}{4}$ of $6\frac{1}{2}$ of $8\frac{1}{3}$ of $\frac{9\frac{1}{2}}{11\frac{1}{3}}$ of $\frac{8\frac{1}{2}}{17\frac{1}{2}}$ of ·9 of $\frac{3}{5}$ of ·63

$$= \frac{2}{7} \times \frac{13}{4} \times \frac{13}{2} \times \frac{25}{3} \times \frac{\frac{19}{2}}{\frac{34}{3}} \times \frac{\frac{17}{2}}{\frac{35}{2}} \times \frac{9}{10} \times \frac{3}{5} \times \frac{63}{100}$$

$$= \frac{2}{7} \times \frac{13}{4} \times \frac{13}{2} \times \frac{25}{3} \times \frac{57}{68} \times \frac{17}{35} \times \frac{9}{10} \times \frac{3}{5} \times \frac{63}{100}$$

$$= \frac{13 \times 13 \times 57 \times 9 \times 9}{7 \times 4 \times 4 \times 10 \times 100} = \frac{760273}{112000} = 6\frac{108273}{112000}$$

(45)

23 a. 3 r. 30 per. at $47·80 per acre.

2 roods	½	$47·80
		23
		$1099·40
1 rood	¼	23·90
20 per.	½	11·95
10 per.	½	5·97½
		2·98¾
		$1144·21¼

(46)

$100 stock = $1·08⅓ money or $1 stock
= $1·08⅓ money.
$1·08⅓ × 2400 = $2604.

(47)

50 miles = 50 × 5280 × 12 = 3168000 inches
2 ft. 5 in. = 29 inches = inches in 1 pace.
3168000 ÷ 29 = 109241$\frac{11}{29}$ = number of paces.

(48)

$100 + $16 = $116

$$\$116 : \$100 :: \$7890 : \frac{\$7890 \times 100}{116} = \$6801·72\tfrac{12}{29}.$$

(49)

Int. of $1 for 7 yrs. 3 mos. 20 days or for 87 mos. 20 dys.
= $0·435 + $0·003⅓ = $0·438⅓
$0·438⅓ × 894·80 = $392·220⅔

(50)

A can do the whole work in 24 days, hence in 1 day he can do $\frac{1}{24}$ of it.

B can do the whole work in 30 days, therefore in 1 day he can do $\frac{1}{30}$ of it.

In 7 days A does $\frac{7}{24}$ of the work, leaving $\frac{17}{24}$ to be done by A and B together.

Then $\frac{1}{24} + \frac{1}{30} = \frac{3}{40}$ = work done by A and B together.

$$\frac{17}{24} \div \frac{3}{40} = \frac{17}{24} \times \frac{40}{3} = \frac{17 \times 5}{3 \times 3} = \frac{85}{9} = 9\frac{4}{9} \text{ days.}$$

(51)

2 lbs. 3 oz. 4 dwt. = 13056 grains.

11 lbs. 7 oz. 9 dwt. 4 grs. = 66940 grains

$\frac{13056}{66940} = \frac{3264}{16735}$.

(52)

£493 16s 4½d = 237033 half-pence

£8 11s 7d = 4118 "

$237033 \div 4118 = 57\frac{2307}{4118}$

(53)

Assu'e 20	5..8..11..14..16..20..22..176..616..42	
Assu'e 21		44..154..21
		44.. 22

l. c. m. = 20 × 21 × 44 = 18480

(54)

$5·34 × 419 = $2237·46 = value of flour

$2237·46 × ·1125 = $251·71425 = commission.

(55)

73 cents $\times$ 47 = \$34·31 = value of barley.

\$34·31 $\div$ 69 = $40\frac{59}{69}$ cents = value of oats per bushel.

(56)

\$4250 $\times$ ·0125 = \$53·125 = insurance.

(57)

A = 207 $\times$ 4 = 828

B = 109 $\times$ 5 = 545

C = 43 $\times$ 5 $\times$ $4\frac{1}{2}$ = $967\frac{1}{2}$

Sum = $2340\frac{1}{2}$

$2340\frac{1}{2} : 828 :: \$200 : \frac{\$200 \times 828}{2340\frac{1}{2}} = \$70·75\frac{1825}{4681}$

$2340\frac{1}{2} : 545 :: \$200 : \frac{\$200 \times 545}{2340\frac{1}{2}} = \$46·57\frac{583}{4681}$

$2340\frac{1}{2} : 967\frac{1}{2} :: \$200 : \frac{\$200 \times 967\frac{1}{2}}{2340\frac{1}{2}} = \$82·67\frac{2173}{4681}$

(58)

23 at 80 cents = 1840 cents.

19 at 75 cents = 1425 cents.

30 at 40 cents = 1200 cents.

42 at 60 cents = 2520 cents.

lbs. in mixture = 114 worth 6985 cents.

6985 cents $\div$ 114 = $61\frac{31}{114}$ cents = price of 1 lb.

(59)

A gets 1 share, B gets 1 share, C gets 2 shares, and D gets 4 shares; therefore they together get 8 times A's share or B's share.

$$\$1100 \div 8 = \$137{\cdot}50 = \text{A's share} = \text{B's share.}$$

$$\$137{\cdot}50 \times 2 = \$275 = \text{C's share.}$$

$$\$137{\cdot}50 + \$137{\cdot}50 + \$275 = \$550 = \text{D's share.}$$

(60)

15 : 25
36 : 48
12 : 8
6 : 5
12 : 9

:: 10 : Ans. $= \dfrac{\overset{5}{\cancel{10}} \times 25 \times \overset{4}{\cancel{48}} \times \overset{2}{\cancel{8}} \times 5 \times 9}{\underset{3}{\cancel{15}} \times \underset{4}{\cancel{36}} \times \underset{3}{\cancel{12}} \times 6 \times \underset{3}{\cancel{12}}}$

$$= \frac{5 \times 25 \times 2}{3 \times 3 \times 3} = 9\tfrac{7}{27}.$$

THE END.