

$$\frac{(x-y)(y-z)(z-x)}{(a-b)(b-c)(c-a)} = \frac{xyz}{abc}.$$

* 6. Employ Horner's method of division to divide

$$(1) 12x^4 + 21x^3y - 20x^2y^2 - 86x^3y^3 + 85y^4 \text{ by } 3x^2 - 5y^2;$$

(2) 1 by $1-x+x^2$ to six terms in the quotient, and write down the remainder.

Shew that the next six terms may be obtained without actually dividing.

* 7. Find the value of

$$(1) (x-1)^4 \text{ when } x = \sqrt{-1};$$

$$(2) \frac{\sqrt{a+x} + \sqrt{a-x}}{\sqrt{a+x} - \sqrt{a-x}} \text{ when } x = \frac{2ac}{1+c^2}.$$

* 8. Eliminate x and y from

$$x(y+9) = 5(y+1), \quad (x+7)(y-1) = 0, \\ xy = m.$$

* 9. Shew that $ax^2 + bx + c = a(x-p)(x-q)$ where p, q are the roots of the equation $ax^2 + bx + c = 0$.

One of the roots of the equation $24x^3 - 46x^2 + 29x = 6$ is $\frac{2}{3}$, find the other two roots.

$$10. \text{ If } \frac{x}{a-b-c} = \frac{y}{b-c-a} = \frac{z}{c-a-b}$$

shew that $(b-c)x + (c-a)y + (a-b)z = 0$; and that $a(y-z) + b(z-x) + c(x-y) = 0$.

* 11. Solve the equations

$$a = bz + cy, \quad b = cx + az, \quad c = ay + bx;$$

$$\text{and shew that } \frac{1-x^2}{a^2} = \frac{1-y^2}{b^2} = \frac{1-z^2}{c^2}.$$

* 12. A person borrows \$1,000 for two years and discharges the debt by paying \$600 at the end of one year and \$600 at the end of two years. What rate per cent. per annum (compound) interest did he pay?

* 13. A square plot of ground is surrounded by a gravel walk of uniform width which covers 891 sq. ft. of ground. Outside this walk, at a uniform distance of half the length of the plot is a second walk (of the same width as the first) which covers 1,903 sq. ft. of ground. Find the size of the plot.

MODERN LANGUAGES.

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EXERCISES IN ENGLISH.

1. Expand the following sentences into (1) Compound (2) Complex.

(a) Fearing to be asked about it he kept out of her way.

(b) He has not answered either of my letters.

(c) I doubt the correctness of the last speaker's figures.

(d) Notwithstanding the heavy rain there was a large attendance.

(e) You must bear the consequences of having broken the rule.

(f) We could not have escaped without their assistance.

2. Contract into simple sentences:

(a) The report may be true, but I can hardly believe it.

(b) They were so numerous that I could not count them.

(c) As we knew what a difficult task it would be we were unwilling to attempt it.

(d) They will all be glad when they hear that he has arrived.

(e) He made a second attempt, but it was as unsuccessful as the first.

(f) It is certain that it could not have been he that wrote it.

3. Change the voice of all the finite verbs in the following:

(a) Has the secretary received any applications?

(b) Examples of this may be found in almost every lesson.

(c) Why did not some one notify him of the meeting?

(d) No answer has been given to the question that he asked.

(e) How many times do they expect me to repeat it?

(f) It is said that he was never made aware of it.

4. Arrange in as many ways as possible without altering the sense:

(a) The Iroquois, regardless of their promise, fell upon them.