

$$(3) y = \frac{b+c-a}{2}$$

Multiplying (1) by (2) and dividing by (3)

$$x = \frac{(a+b-c)(c+a-b)}{2(b+c-a)}$$

(2) Dividing 1st by 2nd

$$x^2 - xy + y^2 = 3$$

$$x^2 + xy + y^2 = 7$$

$$xy = 2 \quad \text{solve as usual.}$$

(3) Plainly $x-a$ is a factor, for when x is put $=a$ in the left hand side it vanishes.

Other factor is $x^2 + a - \frac{1}{a}$. Put $=0$ and solve.

(4) Divide through by x^2 and arrange thus

$$6 \left(x^2 + \frac{1}{x^2} \right) - 35 \left(x + \frac{1}{x} \right) + 62 = 0$$

$$\left(x^2 + \frac{1}{x^2} + 2 \right) - 35 \left(x + \frac{1}{x} \right) = -\frac{50}{6}$$

$$\left(x + \frac{1}{x} \right)^2 - 35 \left(x + \frac{1}{x} \right) = -\frac{25}{3}$$

Solve as usual.

8. Book work.

(a) When x is greater than a or b the fraction becomes

$$\frac{x-a}{x-b} > \frac{a}{b}$$

$$\text{as } bx - ab > ax - ab$$

$$\text{as } bx > ax$$

$$b > a$$

$$\therefore \frac{a-x}{b-x} \text{ is } > \frac{a}{b} \text{ if } \frac{a}{b} \text{ is proper fraction}$$

$$\frac{a-x}{b-x} \text{ is } < \frac{a}{b} \text{ if } \frac{a}{b} \text{ is an improper fraction.}$$

9. Book work.

(1). Required root is

$$\sqrt{\frac{a + \sqrt{a^2 - b}}{2}} + \sqrt{\frac{a - \sqrt{a^2 - b}}{2}}$$

hence, unless $a^2 - b$ is a perfect square, the expression will not be more simple.

$$(2) \frac{a + b\sqrt{-1}}{a - b\sqrt{-1}} + \frac{a - b\sqrt{-1}}{a + b\sqrt{-1}}$$

$$= \frac{a^2 + 2ab\sqrt{-1} - b^2 + a^2 - 2ab\sqrt{-1} - b^2}{a^2 + b^2}$$

$$= \frac{2(a^2 - b^2)}{a^2 + b^2}$$

$$(3) \sqrt{3 + 4\sqrt{-1}} = 2 + \sqrt{-1}$$

$$\sqrt{3 - 4\sqrt{-1}} = 2 - \sqrt{-1}$$

$$\text{Sum} = 4.$$

10. Let $x = A$'s rate per hour

$$y = B$$

$$x - y = 2$$

$$\frac{1}{y} - \frac{1}{x} = \frac{1}{40} \quad \text{Solve}$$

$$y = 8 \text{ or } -10$$

$$x = 10 \text{ or } -8.$$

CLASSICS.

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BRADLEY'S ARNOLD.

EXERCISE 21.

1. Caesar utrum jure caesus fuerit, an nefarie necatus dubitari potest; Inter omnes constat a Bruto eum, et Cassio ceterisque qui conjuraverant Idibus Martiis occisum esse.
2. Nostri vicerint ne neque, adhuc est incertum; sed sive vicerint seu victi sunt, certe scio eos neque sociis defuisse, nec, reipublicae.
3. Utrum hominibus nocuerit plus, an profuerit, difficile dictu est; illud dubitari non potest talem vel ingenio eum, vel rebus gestis fuisse qualem in hac vita visuri sumus nunquam.
4. Vix credi potest quoties et ego et tu istum monuerimus ne fidem falleret, sed videmur sicut heri ac pridie; ita eras nihil acturi.
5. Fac ad me scribas quando rex ad exercitum pro ectorus sit; qui nescio an consulo cunctetur ut exercitum comparet opes suas augeat; quod veror ut efficiat; homines enim aut pertimescant, aut male sentiant.
6. Monuit me nescio quis ne obliviscerer, tu quantum mihi quondam puero nocueris; quod feceris, necne pluri referi; illud mea interest, num amicis esse meus velis hodie.
7. Quum sentiret se gravi vulnere exhaustum, quaesivit primum salvisne esset clipeus; saluum esse responderunt; deinde fusine essent hostes; fusos esse responsum est.
8. Nonne mori satius esset rogaverunt quam inhoneste vivere.
9. Milium is meorum mihi fuit carissimus, et nescio an unus omnium fortissimus.