

Danford High School 9th Grade.
 May, 21st 1907 F. Eugene Bourillet
 Algebra 88

I (a) Solve $\frac{x-3}{4} - \frac{x-1}{9} = \frac{x-5}{6}$.

(b) The difference between two numbers is 20, and $\frac{1}{3}$ of one is equal to $\frac{1}{3}$ of the other. Find the numbers.

(a) $\frac{x-3}{4} - \frac{x-1}{9} = \frac{x-5}{6} \therefore 9x-27-4x+4=6x-30. +x=+7$

(b) Let x = one number. $\frac{x}{7} = \frac{x-20}{3}$. $3x=7x-14$
 " $x-20$ = other .. . $\frac{7}{3}$ $x=35$ = one
 $x-20=15$ = other

II Find the value of the following:

(a) $1 - \frac{1}{1+\frac{1}{a}}$ } (b) $\frac{a+x}{x} - \frac{2a}{a+x} + \frac{ax-a^3}{x(a^2-x^2)}$

(a) $1 - \frac{1}{\frac{a+1}{a}} \cdot \frac{a+1}{1+a} = \frac{a}{a+1} \cdot 1 - \frac{a}{a+1} = \frac{1}{a+1}$

(b) $\frac{a+x}{x} - \frac{2a}{a+x} + \frac{ax-a^3}{x(a+x)(a-x)} =$

~~$a^2x^2+a^2x-x^3-2a^2x+ax^2+a^2x-a^3$~~ $= \frac{x^2(a-x)}{x(a^2-x^2)}$

III What is a simple equation?

" " " quadratic " ?

" " " literal " ?

" are simultaneous " ?

Give examples of each of the above.

degree

$$4x^2 + y^4 = 67.$$

A literal equation is one in which nothing but letters are used. $2a - b = a + b$.

Simultaneous equations are those in which the same letters have the same values. $\begin{cases} x+y=6 \\ x-y=2 \end{cases}$

~~11~~ Solve $\frac{y+1}{y-1} - \frac{y-1}{y+1} = \frac{3}{y-1}$

$$y^2 + 2y + 1 - y^2 + 2y - 1 = 3y + 3.$$

$$3y = 3 - 2$$

$$y = \frac{1}{3} = \text{Ans.}$$

~~10~~ A person in buying sugar found that if he bought sugar at $11\frac{1}{2}$ ¢ he would lack 30¢ of having enough money to pay for it; so he bought sugar at $10\frac{1}{2}$ ¢ and had 15¢ left. How many pounds did he buy?

$$x = \text{no. lbs.}$$

$$x \text{ lbs } @ 11\frac{1}{2} \text{¢} = 11x. \quad x \text{ lbs } @ 10\frac{1}{2} \text{¢} = \frac{21}{2}x$$

$$11x - 30 = \frac{21}{2}x + 15. \quad 22x - 60 = 21x + 30$$

$$x = 90. \quad 90 \text{ lbs} = \text{Ans.}$$

~~11~~ Solve by Subtraction:

$$(a) 5x + 6y = 61 \quad \left\{ \begin{array}{l} \text{(b) Solve by comparison.} \\ 4x + 5y = 56 \end{array} \right.$$

$$\begin{array}{r} 20x + 24y = 244 \\ 20x + 25y = 256 \\ \hline -y = -6 \end{array} \quad \left\{ \begin{array}{l} 2x - 3y = 3 \\ 4x + 5y = 39 \end{array} \right.$$

$$\begin{array}{r} 3 + 3y = 34 - 54 \\ \hline 2y = -20 \\ y = -10 \end{array}$$

$$\begin{array}{r} 3 + 3y = 78 - 10y \\ 13y = 75 \\ y = 5. \end{array}$$

$$x = 6$$

$$x = p$$

$$y = q$$

$$13d = 30$$

$$2 + 3d = 30 - 10q$$

VII Find x and y :

$$\left\{ \begin{array}{l} \frac{1}{x} + \frac{2}{y} = 10 \\ \frac{4}{x} + \frac{3}{y} = 20 \end{array} \right. \quad \begin{array}{l} y + 2x = 10xy \\ 4y + 3x = 20xy \end{array}$$
$$\begin{array}{l} 4y + 8x = 40xy \\ 4y + 3x = 20xy \end{array}$$

(10)

$$(a) 2x + ad = 01 \quad (b) 20m \cdot 5x = 20xy$$

at 20m is 7 approximation: $y = \frac{1}{4}$,
at 20m is 5 $x = 01$, $x = \frac{1}{3}$

VIII There is one of two digits which is equal to 4 times the sum of the digits, and if 18 be added to the no the result will be expressed by the digits interchanged, what is the no.

Let x = digits in tens place

Let y = one " units " of 10, i.e.

$$10x + y = no$$

$$\left\{ \begin{array}{l} 10x + y = 4(x+y) \\ 10x + y + 18 = 10y + x \end{array} \right.$$

$$6x - 3y = 0$$

$$9x - 9y = 18$$

$$18x - 9y = 0$$

$$9x - 9y = 18$$

$$9x = 18$$

$$x = 2$$

$$y = 4$$

$$24 = no$$

$$g_1 = x$$

$$m = x_8$$

$$\overline{851} = \sum_{i=1}^n x_i - x_8$$

$$\overline{84} = \sum_{i=1}^n x_i + x_8$$

$$\overline{66} = \sum_{i=1}^n x_i - x_8$$

$$\overline{92} = \sum_{i=1}^n x_i + x_8$$

$$\overline{12} = \sum_{i=1}^n x_i + h_2 + x_8$$

$$5 = \sum_{i=1}^n x_i + h_2 - x_8$$

$$h = h \cdot g_1 = hh -$$

$$\overline{12} = \sum_{i=1}^n x_i + h_2 + x_8$$

$$y = \sum_{i=1}^n x_i + h_2 - x_8$$

$$\overline{12} = \sum_{i=1}^n x_i + h_2 + x_8$$

$$- \sum_{i=1}^n x_i - y$$