

1. Why in which line can interest

$$2x + 3y = 10$$

$$10x + 15y = 50$$

$$2x = (10 - 3y)$$

$$5(10 - 3y) + 15y = 50$$

$$50 - 15y + 15y = 50$$

$$50 = 50 \text{ infinitely}$$

$$2x + y = 3$$

$$x(1 - 1) - y = -6$$

$$2x + x - x = -6$$

$$2x + x = -6$$

$$x(1 + 1) = -6$$

$$M = 1 \quad x = -1$$

$$(i) \quad y = 2x + 5$$

$$(0, 0) \quad \frac{y - 0}{x - 0} = 2 = 3 = 2x$$

$$(ii) \quad y = 2x + 5$$

$$x = 2y + 5$$

$$2y$$

$$(iii) \quad \text{infinite} \quad y = 2x + 5$$

$$M = 2$$

$$M = 2$$

$$\frac{y - 7}{x - 1} = 2 \quad y = 2x - 7 + 7$$

$$y = 2x + 5$$

Q. 2

$$y = 2x - 4$$

$$y\text{-intercept } (0, -4)$$

$$x\text{-intercept } (2, 0)$$

$$(b) \quad 2x + 4y = 12$$

$$3(0) = y = 3 \quad (0, 3)$$

$$4(0) = 12 = 2x$$

$$x = 6$$

$$(6, 0)$$

$$(c) \quad x = 5$$

$$y\text{-intercept } (0, 0)$$

$$x\text{-intercept } (5, 0)$$

$$(d) \quad y = 5$$

$$y\text{-intercept } (0, 5)$$

$$x\text{-intercept } (0, 0)$$

$$(e) \quad 2x - 4y = 8$$

$$2x = 4y + 8$$

$$2(0) =$$

$$y = -2$$

$$-2(2) - 4(0) = 8$$

$$-2x = 8$$

$$y = 1.4$$

$$(4, 0)$$

Q. 3

$$a = 1 - b$$

$$1 - b = 1 - 2b$$

$$-b + 2b = 0$$

$$+b = 0$$

$$a = 1$$

$$(b) \quad -3 - 2n = 2n + 1$$

$$4n = -3 - 1$$

$$4n = -4$$

$$n = -1$$

$$(c) \quad 2q - 2 = -3 - 3q$$

$$2q + 3q = -1$$

$$5q = -1$$

$$q = -1/5$$

$$(d) \quad S = -2r + 11$$

$$S = r - 1$$

$$r - 1 = -2r + 11$$

$$3r = 12$$

$$r = 4$$

$$S = 4 - 1 = 3$$

$$(e) \quad p = q + 2$$

$$3(q + 2) + 2q + 1 = 0$$

$$3q + 6 + 2q + 1 = 0$$

$$5q = -7$$

$$q = -1$$

$$p = -1 + 2 = 1$$

$$h \neq w = 2y - 5$$

$$w = 3y$$

$$3y = 2y - 5$$

$$y = -5$$

$$\underline{2} \quad 2y = 5x - 3 \quad y = 2.5x - 3$$

$$2(2.5x - 3) = 3 - y$$

$$5x - 6 = 3 - 6$$

$$-3 \neq -6 \text{ False}$$

$$\underline{3} \quad 3y + 5x = 30 \rightarrow 3y = -5x + 30$$

$$-3y = -5x + 30$$

$$0 \neq 60$$

$$\text{False}$$

Down a line stuff

$$\begin{aligned} \textcircled{A} \quad 2(x-y) &= 2 \\ 3x+y &= 10 \\ x &= (2+y) \\ 2(2+y)+y &= 10 \\ 6+2y+y &= 10 \\ 4y &= 4 \\ y &= 1 \quad x=3 \\ (3,1) &= \end{aligned}$$

$$\begin{aligned} \text{Ans } x &= (4-y) \\ 2(4-y)+y &= 3 \\ 8-2y+y &= 3 \\ y &= 5 \\ x &= 4-5 = -1 \\ (-1,5) &= \end{aligned}$$

$$\begin{aligned} \textcircled{D} \quad a &= 4b-5 \\ 3(4b-10+b) &= 0 \\ 15b &= 10 \\ b &= 2 \quad a = 4-5 \\ &= -1 \end{aligned}$$

$$\begin{aligned} a \quad M-3n &= 10 \\ -M+4n &= -4 \\ \hline -7n &= 14 \\ n &= -2 \\ \hline M &= 10-6 = 4 \\ (4,-2) &= \end{aligned}$$

$$\begin{aligned} \textcircled{P} \quad x &= (6+3y) \\ 2x+3y &= -24 \\ 2(6+3y)+y &= -24 \\ 4y &= -30 \\ y &= -7.5 \\ 12+6y+3y &= -24 \\ 9y &= -36 \\ y &= -4 \\ x &= 6+2(-4) \\ &= -2 \\ (-2,-4) &= \end{aligned}$$

$$\begin{aligned} \text{M} \quad 5x+2y &= 13 \times 2 \\ 2x-3y &= -10 \times 5 \\ \hline 10x+4y &= 26 \\ -10x-15y &= -50 \\ \hline 19y &= 76 \\ y &= 4 \\ x &= 1 \\ (1,4) &= \end{aligned}$$

$$\begin{aligned} \textcircled{L} \quad 2a+3b &= 30 \\ + 4a-3b &= -12 \\ \hline 6a &= 18 \\ a &= 3 \\ y &= 1 \end{aligned}$$

$$\begin{aligned} 7 \quad 2x-y &= 8 \times 1 \\ x-6y &= 4 \times 2 \\ \hline 2x-y &= 8 \\ -2x-12y &= 8 \\ \hline 11y &= 0 \\ y &= 0 \\ x &= 4 \\ (4,0) &= \end{aligned}$$

Time taken to travel on the surface = Distance $\div$ Speed

$$= (160 - x) \div 16$$
$$= \left(\frac{160 - x}{16} \right) \text{ hours}$$

Total time = 12 hours 30 mins

Therefore, $\left(\frac{x}{10} + \frac{160 - x}{16} \right) = 12 \text{ hours } 30 \text{ mins}$

$$\left(\frac{x}{10} - \frac{x}{16} + \frac{160}{16} \right) = 12 \frac{30}{60}$$

$$\frac{3}{80}x + 10 = 12 \frac{30}{60}$$

$$\frac{80}{3} \times \frac{3}{80}x = 2 \frac{1}{2} \times \frac{80}{3}$$

$$x = \frac{200}{3} \text{ km}$$

$$= 66 \frac{2}{3} \text{ km}$$

Time taken when submerged

$$= \frac{66 \frac{2}{3}}{10} = 6 \text{ hours } 4 \text{ minutes}$$

Time travelled on the surface

$$= 12 \text{ hours } 30 \text{ mins} - 6 \text{ hours}$$

$$4 \text{ mins}$$

$$= 5 \text{ hours } 50 \text{ minutes.}$$

4. Patrol boat took 5 hours to travel 60 km upstream, and 3 hrs to return downstream. Find the Speed of Boat and water current.

Solution:

Let the speed of the boat be x km/hr.

And that of water current be y km/hr.

Speed while moving upstream: Distance $\div$ Time

$$= 60 \div 5 = 12 \text{ km/hr.}$$

Speed downstream

$$= 60 \div 3 = 20 \text{ km/hr.}$$

$$\text{Speed upstream} = (x - y) = 12$$

$$\text{Speed downstream} = (x + y) = 20$$

Therefore; $x = 12 + y$

By substitution; $(12 + y) + y = 20$

$$12 + 2y = 20$$

Slope and Eqn of Line

$$(a) \quad M = \frac{\Delta y}{\Delta x} = \frac{-1-2}{8-5} = -\frac{3}{3} = -1$$

GS/3

$$(b) \quad M = \frac{\Delta y}{\Delta x} = \frac{2-2}{-7-5} = \frac{0}{-12} = 0$$

$$(c) \quad \frac{-4-2}{5-5} = \frac{-6}{0} = \infty$$

$$(d) \quad \frac{0-2}{-8-5} = \frac{-2}{-13}$$

Eqn of Line

$$M = 2 \quad (-5, 2)$$

$$y - 2 = 2(x + 5)$$

$$y = 2x + 10 + 2$$

$$= \underline{\underline{2x + 12}}$$

Modelling With Linear Equations
Write system of equations to solve the problems:

1) Let 2 numbers be x and y

$$x + y = 72$$

$$x - y = 48$$

Solving: $x = 48 + y$

By substitution: $(48 + y) + y = 72$

$$48 + 2y = 72$$

$$2y = 24$$

$$y = 12$$

But $x = 48 + y$

$$x = 60$$

2) Let 2 numbers be x and y

$x = 4y$; y is the smaller

Even Number:

$$(6y + \frac{1}{2}x = 212) \times 2$$

$$12y + x = 424$$

Equations $x - 4y = 0$

$$x + 12y = 424$$

Solution

$$x = 4y$$

By substitution: $4y + 12y = 424$

$$16y = 424$$

$$y = 26\frac{1}{2}$$

But $x = 4(26\frac{1}{2})$

$$x = 106$$

3) Let 2 numbers be x and y

$$x - y = 45$$

x is the Larger number

$$3x - 5y = 75$$

Equations, $x - y = 45$

$$3x - 5y = 75$$

Solution

$$x = 45 + y$$

By substitution:

$$3(45 + y) - 5y = 75$$

$$135 + 3y - 5y = 75$$

$$-2y = 75 - 135$$

$$-2y = -60$$

$$y = 30$$

But $x = 45 + y$

$$x = 75$$

Solving linear systems by substitution:

a) $y = 5x - 5$, $y = 2x - 3$

$$(5x - 5) = (2x - 3)$$

$$5x - 2x = -3 + 5$$

$$3x = 2$$

$$x = \frac{2}{3}$$

But $y = 5x - 5$

$$y = 5 \times \frac{2}{3} - 5$$

$$y = -1\frac{1}{3}$$

$$= \left(\frac{2}{3}, -1\frac{1}{3}\right)$$

Application of Linear Equations

$$\textcircled{1} \quad 0.05X + 45 = 0.08X$$

$$45 = 0.03X \quad X = \underline{1500}$$

$$\textcircled{2} \quad 0.065X - 130 = 0.04X + 70$$

$$0.025X = 200$$

$$X = \underline{8000}$$

$$\textcircled{3} \quad 0.07(7000) + 0.11(7000 - X) = 690$$

$$490 + 770 - 0.11X = 690$$

$$0.11X = 570$$

$$X = \underline{5182}, \quad 1818 \text{ at } 7\%$$

$$\textcircled{4} \quad (X)0.1 + (X+3000) \cdot 0.08 = (X+3000)0.10$$

$$0.1X = 0.08X + 240$$

$$X = 12000, \text{ or } \underline{15000}$$

$$\textcircled{5} \quad X(0.065) = (200 - X)0.09$$

$$0.155X = 200 \quad X = \underline{1290}$$

$$\textcircled{6} \quad X(0.08) + (X+1600) \cdot 0.05 = * 0.05X + 80 - 17$$

$$0.08X + 0.05X + 80 = 0.08X$$

$$X = \underline{2100}$$

$$\text{at } 8\% = 164$$

$$0.05 \Rightarrow \underline{185}$$

$$y = 37000$$

$$\textcircled{7} \quad 0.5X + 0.25X$$

$$(0.5X)0.12 + (0.25X) \cdot 0.08 + (0.25X) \cdot 0.06 = 570$$

$$0.06X + 0.02X + 0.015X = 570$$

$$X = \underline{6000} \quad \text{?}$$

(1) Evaluate the following

a) $\frac{1}{4} + \frac{-3}{4} = -\frac{1}{2}$

b) $-\frac{1}{4} - 1\frac{1}{3} = -\frac{19}{12}$

c) $-\frac{3}{5} + \frac{-3}{4} - \frac{7}{10} = \left(\frac{-3}{5} + \frac{-3}{4} \right) = \frac{-27}{20}$

$$\frac{-27}{20} - \frac{7}{10} = \frac{-41}{20}$$

d) $\frac{4}{5} \times \frac{24}{25} = \frac{16}{25}$

e) $\frac{3}{-2} \times \frac{5}{6} = -\frac{5}{4}$

f) $\frac{21}{5} \times \frac{15}{28} \times \frac{12}{9} = \left(\frac{21}{5} \times \frac{15}{28} \right) = \frac{9}{4}$

$$\frac{9}{4} \times \frac{12}{9} = 3$$

g) $\frac{1}{3} \div \frac{6}{9} = 2$

h) $\frac{7}{4} \div \frac{8}{9} = \frac{63}{32}$

i) $3\frac{5}{7} = (-1\frac{2}{3}) = \frac{-81}{35}$

(2)
a) $\left(\frac{-3}{5} + \frac{1}{-2} \right) - \left(\frac{5}{-8} - \frac{-1}{2} \right) \quad \frac{-2}{5} + \frac{1}{-2} = \frac{-9}{10}$

$$\frac{5}{-8} - \frac{-1}{2} = \frac{-1}{8}$$

$$-\frac{9}{10} \div -\frac{1}{8} = \frac{36}{5}$$

2a) Elimination

$$\begin{array}{r} x+y=4 \\ -x-2y=1 \\ \hline 3y=3 \\ y=1 \quad x=4-1=3 \end{array}$$

$$\begin{array}{r} 2x+y=1 \\ -x+y=2 \\ \hline x=-1 \quad y=1+(2(1)) \\ \quad \quad \quad =3 \end{array}$$

$$\begin{array}{r} 4x+y=13 \\ -4x-y=11 \\ \hline 2y=2 \quad 4x=12 \\ y=1 \quad x=3 \end{array}$$

$$\begin{array}{r} (i) \quad M-3n=11 \quad (2) \\ 2m+10n=6 \quad (1) \\ \hline 2m-6n=22 \\ -2m+10n=6 \\ \hline -16n=16 \quad n=-1 \\ M=\frac{22-6}{2}=\underline{\underline{8}} \end{array}$$

$$\begin{array}{r} (ii) \quad 2x-2y=-6 \quad (2) \\ 3x-2y=-6 \quad (1) \\ \hline 3x-6y=-18 \quad x-2(-6)=-6 \\ -3x-2y=-6 \quad x=6 \\ \hline -4y=-12 \\ y=\underline{\underline{3}} \end{array}$$

$$\begin{array}{r} (n) \quad 4a-3b=-16 \\ -4a+b=0 \\ \hline -4b=-16 \\ b=4 \\ 4a=-16+12 \\ a=\underline{\underline{-1}} \end{array}$$

$$\begin{array}{r} 4(b) \quad x+2y=0 \\ -x-y=3 \\ \hline 3y=-3 \\ y=-1 \\ x=-1(2)=2 \end{array}$$

$$\begin{array}{r} (e) \quad 3x-2y=4 \\ -x-2y=4 \\ \hline 2x+0=0 \\ 2x=0 \\ x=0 \quad y=-2 \end{array}$$

$$\begin{array}{r} (h) \quad 5a=2b-10 \\ -3a=b+18 \\ \hline 0=b-25 \\ b=25 \quad a=40/3 \end{array}$$

$$\begin{array}{r} (j) \quad (6x=12-3y) \quad (1) \\ (-2x=-16+y) \quad (2) \\ \hline 6x=12-3y \\ +6x=-48-3y \\ \hline 0=-36-6y \\ y=-6 \\ 6x=12-3(-6) \\ 6x=30 \\ x=\underline{\underline{5}} \end{array}$$

$$\begin{array}{r} (o) \quad 3x-y=-3 \quad (3) \\ 8x-3y=-12 \quad (1) \\ \hline 9x-3y=-9 \\ -8x-3y=-12 \\ \hline +x=+3 \\ y=-3-3(3) \\ =-3-9 \\ =\underline{\underline{-12}} \end{array}$$

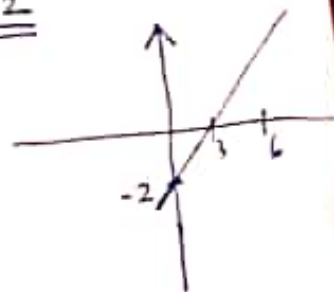
$$\begin{array}{r} (2) \quad (-2,1) \\ p(x)+(q-r)y=-10 \\ p(-2)+(q-r)(1)=-10 \\ -2p+q-r=-10 \\ + (3p+1)-(q-6)=-21 \\ 3p+1-q+6=-21 \\ 3p-q=-21-7 \\ 3p-q=-28 \\ -2p-q=-19 \\ \hline 5p=-9 \quad q=11\frac{3}{5} \\ p=-\frac{9}{5} \end{array}$$

Distinct or coincident lines

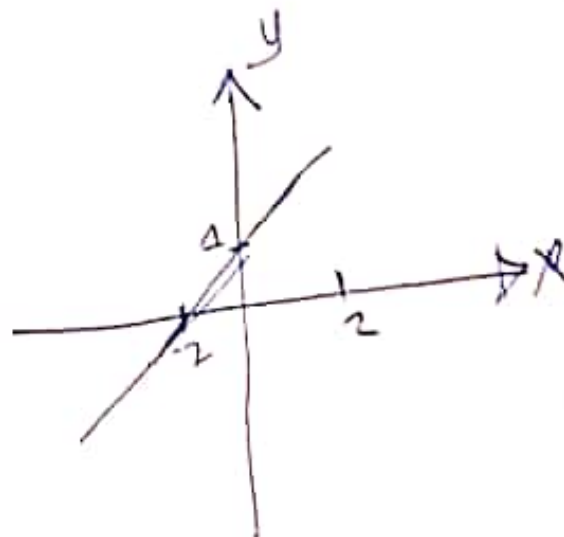
$$\begin{array}{r} (a) \quad y-2x=3 \quad \therefore y=2x+3 \\ 3y-6x=9 \\ 6x+9-6x=9 \\ 9=9 \quad \text{infinitely many solutions} \end{array}$$

$$\begin{array}{r} (b) \quad y=2x+3 \\ y=2x+6 \\ 2x+3=2x+6 \\ 3 \neq 6 \quad \underline{\underline{\text{No solution}}} \end{array}$$

$$y=\frac{2}{3}x-2$$



$$y=-15x+1$$



$$= \frac{42}{100} \times 10 = 4.2$$

Therefore, $(0.3x) + (5 + 0.5x) = 4.2$

$$0.3x - 0.5x = 4.2 - 5$$

$$-0.2x = -0.8$$

$$x = 4$$

Volume of 30% sulphuric acid used = 4 litres

Volume of 50% Sulphuric acid used = 6 litres

3. Total Money invested = \$8000

Some at 9% per annum.

Remainder at 4% per annum.

Total interests = \$420

Solution:

Let the amount invested at 9% rate be x

Remainder = $(8000 - x)$, invested at 4% per annum.

Interests earned by each rate =

$$\frac{9}{100}x \quad \text{and} \quad \frac{4}{100}(8000 - x)$$

But total interests = \$420

$$0.09x + (320 - \frac{1}{25}x) = 420$$

$$0.09x - \frac{0.04}{25}x = 420 - 320$$

$$0.05x = 100$$

$$x = 2000$$

Amount invested at 9% rate = \$2000

Amount invested at 4% rate = \$6000

Geometry and Money Problem

$$2y + \frac{x}{2} = x + y$$

$$4y + x = 2x + 2y$$

$$2y = x \quad \text{--- (i)}$$

$$2y + \frac{x}{2} = 180^\circ - 30^\circ$$

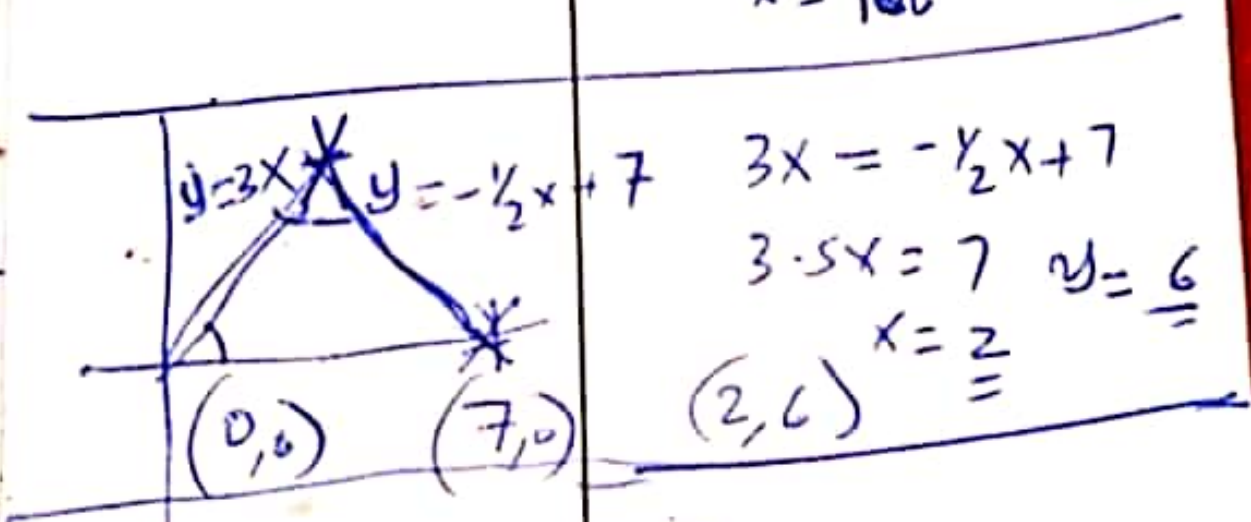
or

$$x + y = 150^\circ$$

$$2y + y = 150^\circ$$

$$y = 50^\circ$$

$$x = 100^\circ$$



$$3x = -\frac{1}{2}x + 7$$

$$3.5x = 7 \quad y = \underline{6}$$

$$x = \underline{2}$$

$$(2, 6)$$

$$\begin{pmatrix} 2 \\ 6 \end{pmatrix} - \begin{pmatrix} 0 \\ 0 \end{pmatrix} = \begin{pmatrix} 2 \\ 6 \end{pmatrix} \sqrt{2^2 + 6^2}$$

$$\sqrt{7^2} = 7$$

$$A = \underline{32.5}$$

$$\begin{pmatrix} 7 \\ 0 \end{pmatrix} - \begin{pmatrix} 2 \\ 6 \end{pmatrix} = \begin{pmatrix} 5 \\ -6 \end{pmatrix}$$

$$\sqrt{25 + 36}$$

$$= \sqrt{61}$$

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5. solving systems of Equ.

$$\textcircled{A} \begin{aligned} 5x - 2y &= 4 \\ 3x + y &= 9 \\ y &= (9 - 3x) \end{aligned}$$

$$\begin{aligned} 5x - 2(9 - 3x) &= 4 \\ 5x - 18 + 6x &= 4 \\ 11x &= 22 \quad x = 2 \\ y &= 9 - 3(2) \\ &= 3 \quad \underline{\text{THE}} \end{aligned}$$

$$\textcircled{B} \begin{aligned} x &= 5 + 2y \\ 3(5 + 2y) - 5y &= 13 \\ 15 + 6y - 5y &= 13 \\ y &= -2 \end{aligned}$$

$$\begin{aligned} x &= 5 + 2(-2) \\ &= 1 \text{ farmer.} \end{aligned}$$

$$\textcircled{C} \begin{aligned} 2y &= -1 + 7x \end{aligned}$$

$$\begin{aligned} 3x - 2(-1 + 7x) &= 19 \\ 3x + 2 + 14x &= 19 \\ 17x &= 17 \quad y = -4 \\ x &= 1 \quad \text{Wito} \end{aligned}$$

$$\textcircled{E} \begin{aligned} 2x &= 27 - 3y \\ 1.5(7 - 3y) + 4y &= 10 \\ 10.5 - 4.5y + 4y &= 10 \\ 0.5y &= 0.5 \\ y &= 1 \end{aligned}$$

$$\begin{aligned} 2x &= 7 - 3 \\ x &= 2 \\ \text{TWEET} \end{aligned}$$

$$\begin{aligned} \underline{A} \\ 4x + 3y &= 9 \\ 4x &= (9 - 3y) \\ \underline{-4} \quad \underline{+} \end{aligned}$$

$$\begin{aligned} 3(9 - 3y) + 4y &= 12 \\ 27 - 9y + 4y &= 12 \\ 27 - 5y &= 12 \\ -5y &= -15 \\ y &= 3 \quad x = \underline{\text{AND}} \end{aligned}$$

$$\textcircled{J} \begin{aligned} 4x - 3y &= -20 \\ -x &= 5 + 8y \\ x &= -5 - 8y \\ 4(-5 - 8y) - 3y &= -20 \\ -20 - 32y - 3y &= -20 \\ -35y &= 0 \\ x &= -5 \quad \underline{\text{selling}} \end{aligned}$$

$$k = y(-4 - 3x)$$

$$\begin{aligned} 5x + 6(-4 - 3x) &= -11 \\ 5x - 24 - 18x &= -11 \\ -13x &= 13 \\ x &= -1, \quad y = -1 \end{aligned}$$

Why is a Hill like a lazy
Young Dog

$$\textcircled{1} \quad 0.05x + 0.27x = 32$$
$$x = \underline{\underline{100}}$$

$$\textcircled{2} \quad 0.08n + 0.12n = 180 - 60$$
$$0.2n = 120$$
$$n = 600$$

$$\textcircled{3} \quad 0.15d + 70 - 0.07d = 130$$
$$0.08d = 60$$
$$d = 750$$

$$\textcircled{4} \quad 0.07x + (x-20)0.13 = 84$$
$$+ 0.26x = 194$$
$$0.07x - 2.6 = 10.13$$
$$x = 970, 13\% = 770$$

$$\textcircled{7} \quad 0.08x + (x-1500)0.10 = 480$$
$$0.02x = 630$$
$$x = \underline{\underline{31500}}$$

at 10% $\rightarrow$ 2050

8% $\rightarrow$ 1556 3500

$$\textcircled{8} \quad x(0.12) + (900-x)0.09 = 96$$
$$0.03x = 15$$

$x = 500$ at 12%

400 at 9%

$$\underline{\underline{10}} \quad 0.06x + (7000-x)0.085 = 520$$

$$0.025x = 75$$

$x = 3000$ 6% interest

- 4000 at 8.5%

7. Modelling with Linear Equations

(1) Homework
 $a + b = 58$
 $-a + 2b = 5$
 $-b = -17$
 $b = 17$ $a = 21$ loaves

(2) $2a + 5b = 155$
 $a + b = 40$
 $a = (40 - b)$
 $80 - 2b + 5b = 155$
 $3b = 75$
 $b = 25$, $a = 15$ - $\frac{1}{2}$

(3) $x + y = 36$
 $y = x + 4$
 $2x + 4 = 36$
 $x = 16$ - b a
 $y = 20$ a

(4) 76 diners | quarters
 $4x + y = 76$
 $x + y = 76$
 $-4x + y = 13$
 $-3x = 66$
 $x = 22$ diners
 $y = 44$ quarters

(5) $y = 4 + 1.5x$
 $y = 5 + x$
 $4 + 1.5x = 5 + x$
 $0.5x = 1$
 $x = \frac{1}{0.5} = 2 \text{ km}$

6
 $a + b = 20$
 $30a + 50b = 700$
 $30(20 - b) + 50b = 700$
 $600 - 30b + 50b = 700$
 $600 - 700 = -20b$
 $b = 5$
 $a = 15$

(7) $2x + \frac{1}{2}y = 48$
 $+ 3x + -0.5y = 27$
 $5x = 75$
 $x = 15$ hen
 $30 + \frac{1}{2}y = 48$
 $\frac{1}{2}y = 18$
 $y = 36$ - $\frac{1}{2}$ hen

P PERCENTAGE MIXTURE PROBLEMS

1. Total Money invested = \$10,000

Let the amount invested in term-deposit paying 4% be X , Therefore, Money invested in bond paying 5% would be, $(10,000 - X)$

Interests earned; $\frac{4}{100} \times X$ and

$$\frac{5}{100} \times (10,000 - X)$$

Total interests = \$440

$$0.04X + \frac{1}{20}(10,000 - X) = 440$$

$$0.04X + 500 - 0.05X = 440$$

$$-0.01X = -60$$

$$X = 6000$$

Money invested in term deposit paying 4% = \$6000

Money invested in bonds paying 5% = \$4000

2. Mr. Lee needs to make 10L of 42% Sulphuric acid. Solutions available are 30% sulphuric acid and 50% sulphuric acid. Find how many litres of each solution should be mixed.

Solution:

Let the volume of 30% solution used be X L

That of 50% solution would therefore be $(10 - X)$ L

Acid content present in X Litres of 30% sulphuric acid = $\frac{30}{100}X = 0.3X$

Acid content present in $X(10 - X)$ Litres of 50% acid = $\frac{50}{100}(10 - X) = (5 - 0.5X)$

Desired acid content in 10 Litres of 42% sulphuric acid

$$2Y = 20 - 12$$

$$2Y = 8$$

$$Y = 4 \text{ km/hr.} -$$

$$X = 12 + Y$$

$$= 12 + 4 = 16 \text{ km/hr.}$$

Speed of water current = 4 km/hr.

Speed of Boat = 16 km/hr.