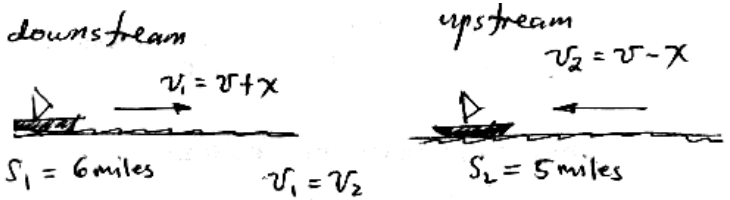
Answer Key

Worded Problems



$v_1 = v_2$

$t_1 = t_2$

$s = vt$

$v = 10$ mph velocity of boat @ still water

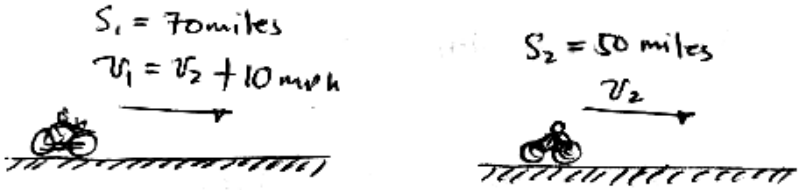
$$\frac{s_1}{v_1} = \frac{s_2}{v_2}$$

$$\frac{6\text{ miles}}{v + x} = \frac{5\text{ miles}}{v - x}$$

$$\frac{6\text{ miles}}{\frac{10\text{ miles}}{\text{hr}} + x} = \frac{5\text{ miles}}{\frac{10\text{ miles}}{\text{hr}} - x}$$

$$x = \frac{10}{11}\text{ mph}$$

$$x = 0.9091\text{ mph}$$



$$t_1 = t_2$$

$$S = vt$$

$$\frac{S_1}{v_1} = \frac{S_2}{v_2}$$

$$\frac{70 \text{ miles}}{v_2 + 10 \frac{\text{miles}}{\text{hr}}} = \frac{50 \text{ miles}}{v_2}$$

$$v_2 = 25 \frac{\text{miles}}{\text{hr}}$$

x = first digit

$x+1$ = second digit

$$3x = (x+1) + 11$$

$$3x = x + 12$$

$$2x = 12$$

$$\boxed{x = 6}$$

x = First integer

$x+2$ = second integer

$$x + x + 2 = 58$$

$$2x + 2 = 58$$

$$2x = 56$$

$$\boxed{x = 28}$$

$$x + y = 55$$

$$x = y + 5$$

Subst:

$$(y + 5) + y = 55$$

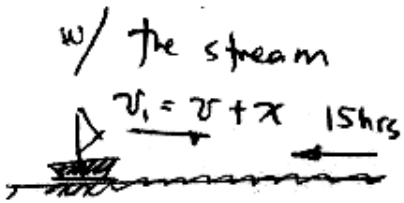
$$2y + 5 = 55$$

$$2y = 50$$

$$y = 25$$

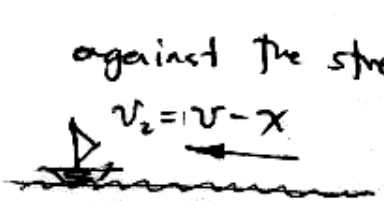
$$\boxed{x = 30}$$

w/ the stream



$S_1 = 5$ miles $S_2 = 12$ miles

against the stream



$S_3 = 2.5$ miles

$$S = vt$$

$$v = \frac{S_2 + S_3}{t_1 + t_2}$$

$$v = \frac{12\text{ miles} + (-2.5\text{ miles})}{15\text{ hrs}}$$

$$v = 0.63333\text{ mph}$$

x = First digit

$y = x - 6$

$x + y = 130$

subst;

$x + (x - 6) = 130$

$2x - 6 = 130$

$2x = 136$

$x = 68$

$y = 62$

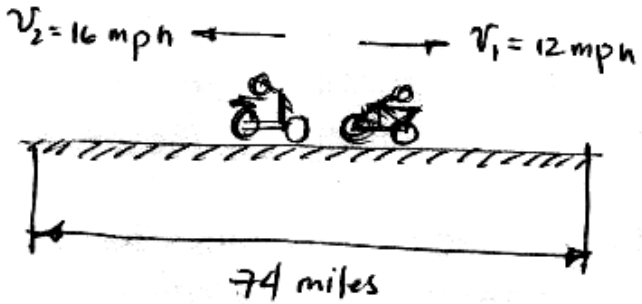
Given: $t = 3\,sec$

$v = 1200\ ft/sec$

from: $S = vt$

$= (1200\ ft/sec)(3\,sec)$

$S = 3600\ ft$



from:

$$S = vt$$

$$74 \text{ miles} = \left(16 \frac{\text{miles}}{\text{hr}}\right) t + \left(12 \frac{\text{miles}}{\text{hr}}\right) t$$

$$t = 2.6429 \text{ sec}$$

15

$$6(x+1) = x - 14$$

$$6x + 6 = x - 14$$

$$5x = -20$$

$$\boxed{x = -4}$$

40%		0%		50%
70 lbs	+	x	=	70 lbs + x

$$0.40(70\text{ lbs}) + 0 = (0.50)(70\text{ lbs} + x)$$

$$28\text{ lbs} = 35\text{ lbs} + 0.50x$$

$$x = -14\text{ lbs}$$

$$\boxed{x = 14\text{ lbs}}$$

	Present	8 yrs
ALEX	$x+6$	$(x+6)+8$
Mario	x	$x+8$

$$(x+6)+8+(x+8)=36$$

$$2x+22=36$$

$$2x=14$$

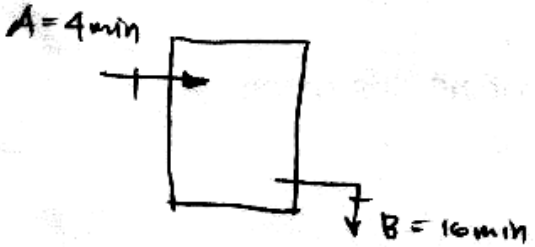
$$x=7$$

Hence; the present age of Alex

$$\text{Alex} = x+6$$

$$= 7+6$$

Alex = 13 yrs old



$$\frac{1}{A} - \frac{1}{B} = \frac{1}{T}$$

$$\frac{1}{4\text{min}} - \frac{1}{16\text{min}} = \frac{1}{T}$$

$$T = 5.3333 \text{ min}$$

$$T = 5 - \frac{1}{3} \text{ min}$$

Luigi = 2B T = 5 days

Susan = B

$$\frac{1}{A} + \frac{1}{B} = \frac{1}{T}$$

$$\left[\frac{1}{2B} + \frac{1}{B} = \frac{1}{5}\right](2B)(B)(5)$$

$$5B + 10B = 2B^2$$

$$2B^2 = 15B$$

$$2B = 15$$

$$\boxed{B = 7.5 \text{ days}}$$

Bryan = 4 hrs

Robert = 3 hrs

T = ?

$$\frac{1}{B} + \frac{1}{R} = \frac{1}{T}$$

$$\frac{1}{4\text{ hrs}} + \frac{1}{3\text{ hrs}} = \frac{1}{T}$$

$$T = 1.7143\text{ hrs}$$

Alcohol 1 = 30%

Alcohol 2 = 45%

30%		45%		43%
x	+	$120-x$	=	$120\ m^3$

$$0.30x + 0.45(120-x) = 0.43(120)$$

$$0.30x + 54 - 0.45x = 51.6$$

$$x = 16\ m^3$$

Pump A = 12 hrs

Pump B = 10 hrs

$$\frac{1}{A} + \frac{1}{B} = \frac{1}{T}$$

$$\frac{1}{12} + \frac{1}{10} = \frac{1}{T}$$

$$T = 7.2 \text{ hrs}$$

	Present	6 yrs
James	$x+5$	$(x+5)+6$
Ruby	x	$x+6$

$$(x+5)+6+x+6=35$$

$$2x=18$$

$$x=9 \text{ years old}$$

5%		0%		12%
12 kg	+	x	=	10 − x

$$0.05(12) + 0 = 0.12(10 - x)$$

$$0.6 = 1.2 - 0.12x$$

$$0.12x = 0.6$$

$$\boxed{x = 5 \text{ kg}}$$

$$t = \frac{12}{11}(30\text{mn})$$

$$t = 32.73$$

$$t = 10:32.73$$

First: x

Second: $x+2$

$$x(x+2) = 35$$

$$x^2 + 2x - 35 = 0$$

$$x_1 = 5$$

$$x_2 = -7$$

smaller integer = 5

$$y \propto x$$

$$y = kx$$

$$5 = k(14)$$

$$k = \frac{5}{14}$$

Hence;

$$y = \frac{5}{14}(25)$$

$$\boxed{y = 8.9286}$$

$$F \propto L$$

$$F = kL$$

$$50\,kN = k(6\,mm)$$

$$k = \frac{50}{6}\ \frac{kN}{mm}$$

Hence;

$$150\,kN = \frac{50}{6}\ \frac{kN}{mm}(L)$$

$$\boxed{L = 18\,mm}$$

$(x+1800)(0.09)$ investment A

$0.13x$ investment B

$$(x+1800)(0.09)+0.13x=200$$

$$0.09x+162+0.13x=200$$

$$0.22x=38$$

$$x=₱172.7273$$

$L = 3w + 2$

$A = 35\ m^2$

$A = LW$

$35 = (3w + 2)w$

$35 = 3w^2 + 2w$

$3w^2 + 2w - 35 = 0$

$w_1 = 3.0985\ m$

$w_2 = -3.7652\ m$ (disregard)

Hence;

$L = 3(3.0985) + 2$

$L = 11.2955\ m$

$L = 6 + W$

$A = 60\,cm^2$

$A = LW$

$60 = (6 + W)W$

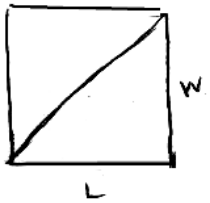
$60 = 6W + W^2$

$W^2 + 6W - 60 = 0$

$W_2 = -11.3066\,cm$ (disregard)

$W_1 = 5.3066\,cm$

P = 150 m
D = 60 m



$A = LW$

$P = 2L + 2W$

$150m = 2(L + W)$

$L + W = 75m$

$D^2 = L^2 + W^2$

$D^2 = (75 - W)^2 + W^2$

$60^2 = W^2 - 150W + 5625 + W^2$

$3600 = 2W^2 - 150W + 5625$

$2W^2 - 150W + 2025 = 0$

$W_1 = 57.3431\ m$

$W_2 = 17.6569\ m$ (disregard)

Solving for L;

$L + 57.3431m = 75m$

$L = 17.6569\ m$

Hence;

$A = (17.6569\ m)(57.3431m)$

$A = 1012.5014\ m^2$

$(x + 2000)(0.08)$ First investment

$0.15x$ Second investment

$$(x + 2000)(0.08) = 0.15x$$

$$0.08x + 160 = 0.15x$$

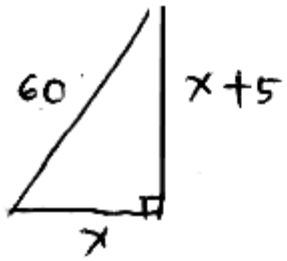
$$x = ₱2285.7143$$

cost: ₱350/day + ₱15/mile

~~₱500~~/day − ₱350/day = ₱150/day

Hence; $\frac{₱15}{\text{mile}} = \frac{₱150}{x}$

$x = 10 \text{ miles}$



From;

$$60 = \sqrt{x^2 + (x+5)^2}$$

$$x = 32.7668 \text{ m}$$

For 1 hour:

5 men = 2(25 sticks) = 50 sticks

by ratio & proportion

$$\frac{5 \text{ men}}{50 \text{ sticks}} = \frac{12 \text{ men}}{X}$$

X = 120 sticks of cigarettes

$$\frac{₱7000}{₱35000} = \frac{x}{₱183000}$$

$$x = ₱36600$$