

October 9th, 2007

Word Problems

① Expressions and Equations

a) The length is four times the width

$$l = 4w$$

b) The length is four more than the width

$$l = 4 + w$$

c) The length is three less than twice the width

$$l = 2w - 3$$

d) The difference between the length and width

$$l - w$$

② For word problems

You buy 6 freezies & 4 popsicles for \$4.20
I buy 8 freezies & 2 popsicles for \$4.10
What is the cost of each?

Let f = cost of freezies

Let p = cost of popsicle

$$6f + 4p = 4.20 \rightarrow 6f + 4p = 4.20$$

$$8f + 2p = 4.10 \rightarrow \begin{array}{r} 16f + 4p = 8.20 \\ -10f \quad = -4.00 \\ \hline f = 0.4 \end{array}$$

$$\text{sub } f = 0.40 \text{ into } 6f + 4p = 4.20$$

$$6(0.4) + 4p = 4.20$$

$$2.4 + 4p = 4.20$$

$$4p = 1.80$$

$$p = 0.45$$

\therefore freezies cost \$0.40
popsicles cost \$0.45

③ Interest

You invest 1000 in a 4%/a + GIC 5%/a

If you earn \$45 in interest in one year,

How much money did you invest in each?

Let a = amount of money invested at 4%/a

Let b = amount of money invested at 5%/a

$$0.04a + 0.05b = 45$$

$$a + b = 1000$$

$$a = 1000 - b$$

$$\text{sub } a = 1000 - b \text{ into } 0.04a + 0.05b = 45$$

$$0.04(1000 - b) + 0.05b = 45$$

$$40 - 0.04b + 0.05b = 45$$

$$0.01b = 5$$

$$b = 500$$

sub $b=500$ into $a=1000-b$

$$a=500$$

\therefore You invest \$500 at $4\frac{1}{2}\%$ & \$500 at $5\frac{1}{2}\%$

④ % Problem

You mix 15% granola and 30% granola to get 600g of 21% granola.
How much of each do you mix?

Let x = mass of 15% granola
Let y = mass of 30% granola

$$\begin{aligned}x + y &= 600 \\ 0.15x + 0.3y &= 0.21(600)\end{aligned}$$

$$\begin{array}{rcl}x + y &= & 600 \\ 0.15x + 0.3y &= & 126 \\ \hline & \rightarrow & 0.3x + 0.3y = 180 \\ & \rightarrow & \ominus \quad 0.15x + 0.3y = 126 \\ & & \hline & & 0.15x = 54 \\ & & x = 360g\end{array}$$

sub $x = 360g$ into $x + y = 600$

$$\begin{aligned}360 + y &= 600 \\ y &= 600 - 360 \\ y &= 240g\end{aligned}$$

\therefore you mix 360g of 15% granola & 240g of 30% granola.

October 10th, 2007

Word Problems

① A box of 32 books weigh 68 lbs. If we remove 10 books, it weighs 50 lbs. find weight of each of book & box.

② You want to make 30L of 25% H_2SO_4 from 15% H_2SO_4 and 42% H_2SO_4 . How much of each do you need.

③ Divide 500 into parts such that the larger is 5 less than 5 times the smaller. Find parts.

① Let b = weight of box
Let a = weight of books

$$b + 32a = 68$$

$$b + 22a = 50$$

$$b + 32a = 68$$

$$- b + 22a = 50$$

$$10a = 18$$

$$10a = 18$$

$$10 \quad 10$$

$$a = \frac{9}{5} = 1.8$$

$$b + 32\left(\frac{9}{5}\right) = 68$$

$$b + \frac{288}{5} = 68$$

$$b = \frac{340}{5} - \frac{288}{5}$$

\therefore books weigh 1.8 lbs
box weigh 10.4 lbs.

② Let $x =$ # litres of 15% H_2SO_4
Let $y =$ " " " 42% H_2SO_4

$$0.15x + 0.42y = 0.25(30)$$

$$0.15x + 0.42y = 7.5$$

$$x + y = 30$$

sub $y = 30 - x$ into $0.15x + 0.42y = 7.5$

$$0.15x + 0.42(30 - x) = 7.5$$

$$0.15x + 12.6 - 0.42x = 7.5$$

$$-0.27x = -5.1$$

$$x = 18.9 \text{ L}$$

$$y = 11.1 \text{ L}$$

\therefore 18.9 L of 15% H_2SO_4

11.1 L of 42% H_2SO_4

③ Let $x =$ larger #
Let $y =$ smaller #

$$x + y = 500$$

$$x = 5y - 5$$

$$x + y = 500$$

$$-x - 5y = -5$$

$$6y = 505$$

$$y = \frac{505}{6}$$

sub $y = \frac{505}{6}$ into $x = 5y - 5$

$$x = 5\left(\frac{505}{6}\right) - 5$$

$$x = \frac{2525}{6} - 5$$

$$x = \frac{2495}{6}$$