Quiz 6 on Multi-Step Word Problems

1) Carlos bought 3 sodas for 65¢ each, 2 hot dogs for $1.25 each, and a hamburger for $1.75. He paid with $10. Find his change.

Unknown: change

Given:
3 sodas @ $.65
2 hot dogs @ $1.25
1 hamburger @ $1.75
paid with $10.00

Total spending

sodas	3($.65)	=	$1.95
hot dogs	2($1.25)	=	2.50
hamburger		=	1.75
Total			$6.20

Change

$10.00
6.20
$ 3.80

2) A ceiling requires a support must be placed every $5\frac{3}{4}$ feet. How many supports are required for a ceiling $34\frac{1}{2}$ feet long?

Unknown: number of supports

Given: support every $5\frac{3}{4}$ feet
ceiling = $34\frac{1}{2}$ feet

Number of supports

$$\frac{\text{ceiling length}}{\text{support distance}} = \frac{34\frac{1}{2}}{5\frac{3}{4}}$$

$$= \frac{\frac{69}{2}}{\frac{23}{4}}$$

$$= \left(\frac{\overset{3}{\cancel{69}}}{\underset{1}{\cancel{2}}}\right)\left(\frac{\overset{2}{\cancel{4}}}{\underset{1}{\cancel{23}}}\right)$$

= 6 supports

Note: Canceling is allowed.

3) Melissa wants to use 20% of her $375 take-home pay for an apartment. How much will she have left after paying for her apartment?

Unknown:
apartment cost
amount left

Given:
20% on an apartment
take-home pay = $375

Apartment cost

$$\frac{20}{100} = \frac{x}{\$375}$$

$$(20)(375) = (100)(x)$$

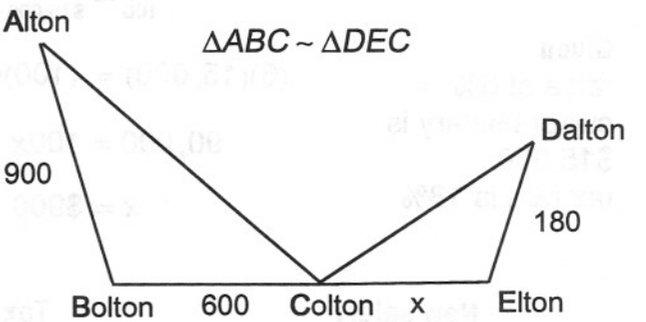
$$7,500 = 100x$$

$$x = \$75$$

Amount Left

$$\$375 - \$75 = \$300$$

4) These five cities are located on the angles of 2 similar triangles. Driving at 40 miles per hour, how long will it take to drive from Colton to Elton?



Distance to Elton

$$\frac{AB}{BC} = \frac{DE}{EC}$$

$$\frac{900}{600} = \frac{180}{x}$$

$$900(x) = 600(180)$$

$$900x = 108,000$$

$$x = 120 \text{ miles}$$

Time to Elton

$$D = rt$$

$$120 = 40t$$

$$t = 3 \text{ hours}$$

5) It costs \$90 to feed a baseball team of 24 players. Find the cost to feed a 52-member band.

Unknown:
cost to feed 52

Given:
cost to feed 24 = \$90

Solution using proportions

$$\frac{24 \text{ players}}{52 \text{ members}} = \frac{\$90}{x}$$

$$(24)(x) = (52)(90)$$

$$24x = 4,680$$

$$x = \$195$$

Solution using a rate

$$\text{cost per person} = \frac{\text{total cost}}{\text{number of members}}$$

$$= \frac{\$90}{24} = \$3.75$$

band cost = (cost/person)(members)

$$= (\$3.75)(52) = \$195$$

6) Bill's bowling average increased from 160 to 184. What was the percent increase?

Unknown:
change
% of increase

Given:
increased from
160 to 184

Change is 184 - 160 = 24

Percent increase

$$\frac{\%}{100} = \frac{Change}{Original\ Number}$$

$$\frac{x}{100} = \frac{24 \text{ pins}}{160 \text{ pins}}$$

$$(x)(160) = (100)(24)$$

$$160x = 2,400$$

$$x = .15 = 15\%$$

7) Betty received a 6% raise on her \$15,000 annual salary. The tax rate is 18%. How much did she pay in taxes on her new salary?

Unknown:
raise
new salary
taxes paid

Given:
raise of 6%
current salary is \$15,000
tax rate is 18%

Raise

$$\frac{\%}{100} = \frac{Part(is)}{Whole(of)}$$

$$\frac{6}{100} = \frac{x}{\$15,000}$$

$$(6)(15,000) = (100)(x)$$

$$90,000 = 100x$$

$$x = \$900$$

New salary

old salary + raise

= \$15,000 + \$900

= \$15,900

Tax

$$\frac{\%}{100} = \frac{Part(is)}{Whole(of)}$$

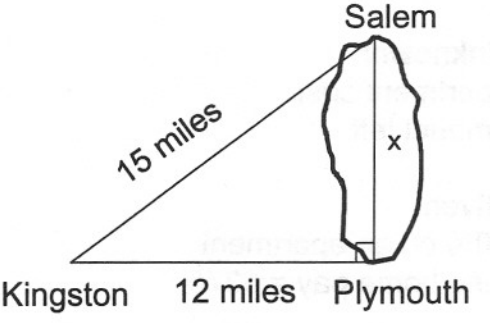
$$\frac{18}{100} = \frac{x}{\$15,900}$$

$$(18)(15,900) = (100)(x)$$

$$286,200 = 100x$$

$$x = \$2,862$$

8) Paul plans to fly his plane from Salem to Plymouth over Blue Lake. He knows the direct flight from Salem to Kingston is 15 miles and it is 12 miles from Kingston to Plymouth. What distance will he travel?



Distance from Salem to Plymouth

$$15^2 = 12^2 + b^2$$

$$225 = 144 + b^2$$

$$225 - 144 = 144 - 144 + b^2$$

$$81 = b^2$$

$$b = 9$$

Total Distance

15 + 12 + 9 = 36 miles