Quiz 6 on Multi-Step Word Problems

1) Carlos bought 3 sodas for $0.65 each, 2 hot dogs for $1.25 each, and a hamburger for $1.75. He paid with $10. Find his change.

Unknown: Given:
change 3 sodas @ $0.65 2 hot dogs @ $1.25 1 hamburger @ $1.75 paid with $10.00

Total spending
sodas 3($0.65) = $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: Given:
number of supports support every 5\(\frac{3}{4}\) feet ceiling = 34\(\frac{1}{2}\) feet

Number of supports

\[
\frac{\text{ceiling length}}{\text{support distance}} = \frac{34\frac{1}{2}}{5\frac{3}{4}} = \frac{69}{23} = \frac{3}{2}
\]

= 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?

\[\triangle ABC \sim \triangle DEC\]

Distance to Elton Time to Elton

\[
\frac{AB}{BC} = \frac{DE}{EC}
\]

\[
D = rt
\]

900 600 Colton x Elton

\[
\frac{900}{600} = \frac{180}{x}
\]

120 = 40t

\[
t = 3\text{ hours}
\]

900(x) = 600(180)

900x = 108,000

x = 120 miles
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**
\[
\frac{24 \text{ players}}{52 \text{ members}} = \frac{90}{x}
\]
\[
(24)(x) = (52)(90)
\]
\[
24x = 4,680
\]
\[
x = \frac{4,680}{24} = 195
\]

**Solution using a rate**
\[
\text{cost per person} = \frac{\text{total cost}}{\text{number of members}}
\]
\[
\text{band cost} = \left(\frac{\text{cost/person}}{\text{members}}\right) = \left(\frac{90}{24}\right)(52) = 195
\]

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**
\[
\frac{\%}{100} = \frac{\text{Part(is)}}{\text{Whole(of)}}
\]
\[
\frac{6}{100} = \frac{900}{15,000}
\]
\[
x = \frac{900}{6} = 150
\]

**New salary**
\[
\text{old salary} + \text{raise}
\]
\[
= 15,000 + 900
\]
\[
= 15,900
\]

**Tax**
\[
\frac{\%}{100} = \frac{\text{Part(is)}}{\text{Whole(of)}}
\]
\[
\frac{18}{100} = \frac{x}{15,900}
\]
\[
x = \frac{18}{100} \times 15,900 = 286,200
\]
\[
x = \frac{286,200}{100} = 2,862
\]

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**
\[
15^2 = 12^2 + b^2
\]
\[
225 = 144 + b^2
\]
\[
b^2 = 81
\]
\[
b = 9
\]

**Total Distance**
\[
15 + 12 + 9 = 36 \text{ miles}
\]