Math 10–Unit 5–6.1 to 6.5; 7.1 to 7.5

To the Test–be sure to bring:

(1) your personally-prepared 8 ½"by 11" study guide for this test
(2) your simple, non-graphing calculator and
(3) your pencils
(4) ~~your BluGold ID~~

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1. Find the ratio of whole numbers that is equivalent to the ratio of 8 inches to 2 feet.

$12" = 1'$

(Be careful with the units.) units must be the same for RATIOS

$$\frac{8"}{2'} = \frac{8"}{24"} = \frac{1}{3}$$

Find the ratio of whole numbers that is equivalent to the ratio of 6 quarts to 4 gallons.

$4\,qt = 1\,gal$

$$\frac{6\,qt}{4\,gal} = \frac{6\,qt}{16\,qt} = \frac{3}{8}$$

2. Find the rate in simplified form: $\frac{323mi}{17gal}$ $\frac{1575boxes}{25hours}$

$$= 19\ \frac{mi}{gal} \qquad = 63\ \frac{boxes}{hour}$$

3. Player A scored 125 points in 7 games. Player B scorec 365 points in 20 games.
Which player scored at a higher rate?

points per game

$$\frac{125 \text{ points}}{7 \text{ games}} \qquad \frac{365 \text{ points}}{20 \text{ games}}$$

$17.857142\ \frac{points}{game}$ $18.25\ \frac{points}{game}$

Player B scored at a higher rate.

4. State the proportion that represents the following:
If it takes 3 hours to harvest 15 acres of corn, it will take 7 hours to harvest 35 acres of corn.

$$\frac{3 \text{ hours}}{15 \text{ acres}} = \frac{7 \text{ hours}}{35 \text{ acres}}$$

3:15 is as 7:35

5. Solve the equation for the unknown value of x: $\frac{7}{x}=\frac{35}{20}$ $\frac{x}{28}=\frac{5}{35}$

$7(20)=35x$ $35x=5(28)$

$\frac{140}{35}=\frac{35x}{35}$ $\frac{35x}{35}=\frac{140}{35}$

$4=x$ $x=4$

$\{4\}$ $\{4\}$

6. State the proportion you will use to solve this problem, then solve the problem.

A conveyor belt moves 15 boxes in 7 minutes. How many boxes can be moved in 84 minutes?

$\frac{15 \text{ boxes}}{7 \text{ min}}=\frac{x \text{ boxes}}{84 \text{ min}}$ $(15)(84)=7x$

$\frac{1260}{7}=\frac{7x}{7}$

$180=x$ 180 boxes

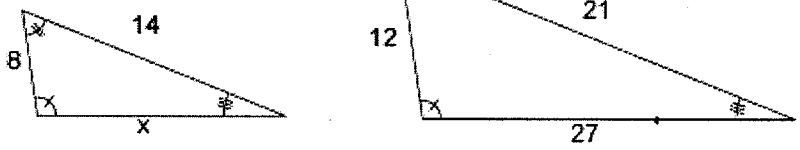
Mini pizzas just went on sale: five pizzas for eight dollars. How much will 9 pizzas cost?

$\frac{5 \text{ pizzas}}{\$8}=\frac{9 \text{ pizzas}}{\$x}$ $5x=(9)(8)$

$\frac{5x}{5}=\frac{72}{5}$

$x=14.40$ \$14.40

7. Find the length of the side marked x if these triangles are similar.



8 is to 12 as x is to 27

$\frac{8}{12}=\frac{x}{27}$

$(8)(27)=12x$

$216=12x$

$18=x$

you could set up others

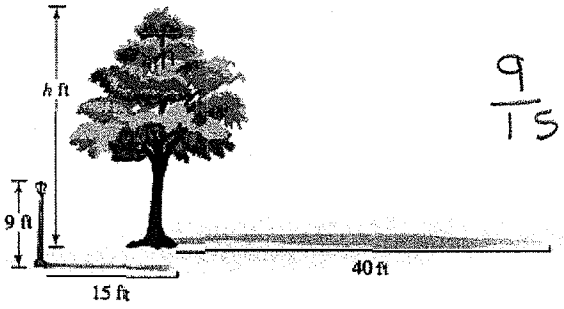
$\frac{8}{x}=\frac{12}{27}$ $\frac{14}{x}=\frac{21}{27}$

$\frac{14}{21}=\frac{x}{27}$

any would work

8. State the proportion you will use to solve this problem, then solve the problem.

A 9' lamppost casts a 15' shadow. At the same time of day, how high of a tree will cast a 40' shadow?



either

$\frac{9}{15} = \frac{h}{40}$ or $\frac{9}{h} = \frac{15}{40}$

$9(40) = 15h$

$\frac{360}{15} = \frac{15}{15}h$

$24 = h$

The tree is 24' high.

If a child 4 ft tall casts a shadow that is 6 ft long, how tall is a tree that casts a shadow that is 15 ft long?

$\frac{4}{6} = \frac{T}{15}$

$4(15) = 6T$

$\frac{60}{6} = \frac{6}{6}T$

$10 = T$

The tree is 10' high.

9. Add 6 ft 5 in. and 9 ft 7 in.

$$\begin{array}{r} 6'\,5'' \\ +\,9'\,7'' \\ \hline 15'\,12'' \end{array}$$

$12'' = 1'$

$15' + 1' = 16'$

Subtract 1 ft 5 in. from 4 ft 9 in.

$$\begin{array}{r} 4\text{ ft }9\text{ in} \\ -\,1\text{ ft }5\text{ in} \\ \hline \end{array}$$

3 ft 4 in

10. Change **37%** percent to a fraction.

$\frac{37}{100}$

Change **250%** percent to a fraction.

$\frac{250}{100} = \frac{25}{10} = \frac{5}{2}$

11. Change 4% to a decimal.

4% → .04

move decimal LEFT 2 places

Change .025% to a decimal.

.025% → .00025

12. Change the following fractions to percents: $\frac{3}{5}$ $\frac{7}{8}$ $\frac{9}{16}$

$\frac{3}{5} = \frac{x}{100}$

$3(100) = 5x$

$\frac{300}{5} = \frac{5x}{5}$

$60 = x$ → 60%

$\frac{7}{8} = \frac{x}{100}$

$700 = 8x$

$\frac{700}{8} = \frac{8x}{8}$

$87.5 = x$ → 87.5%

$\frac{9}{16} = \frac{x}{100}$

$900 = 16x$

$\frac{900}{16} = \frac{16x}{16}$

$56.25 = x$ → 56.25%

13. Use the percent proportion to solve for the unknown amount: What is 55% of 260?

$\frac{\text{RATE}}{\frac{55}{100}} = \frac{x \leftarrow \text{amount}}{260 \leftarrow \text{base}}$ ← always the base

$55(260) = 100x$

$\frac{14300}{100} = \frac{100x}{100}$

$143 = x$ → 143

14. Use the percent proportion to solve for the unknown rate: What percent of 500 is 15?

$\frac{x}{100} = \frac{15}{500}$ ← rate, ← amount, ← base

$500x = 15(100)$

$\frac{500x}{500} = \frac{1500}{500}$

$x = 3$ → 3%

15. Use the percent proportion to solve for the unknown base: 39 is 12% of what?

$\frac{12}{100} = \frac{39}{x}$ ← base

$12x = 39(100)$

$\frac{12x}{12} = \frac{3900}{12}$

$x = 325$ → 325

16. A store marks up items to make a 9.5% profit. If an item costs $22.50 from the supplier, what will the selling price be? Give your answer in dollars and cents.

ORIGINAL + MARKUP = SELLING PRICE

MARKUP = % · ORIG

MARKUP = 9.5% (22.50)

= .095 (22.50)

= 2.1375 Round up, everyone wants a profit!

markup = 2.14

22.50 + 2.14 = $24.64 selling price

17. KT works at the local store for a commission rate of 3.5%. If KT needs to earn $49 for school, how much must KT sell?

3.5% of what = 49

$\frac{3.5}{100} = \frac{49}{x}$ $\quad 3.5x = 4900$ $\quad x = \$1400$

KT must sell $1400.

18. Find the interest you must pay if you borrow $12,000 for 1 year with an interest rate of $4\frac{3}{4}\%$.

$I = p \cdot r \cdot t$

$I = 12000 \cdot 4\frac{3}{4}\% \cdot 1$

$I = 12000 \cdot .0475$

$I = \$570$

$4\frac{3}{4}\%$

4.75%

$.0475$

19. A student needs 70% to pass an examination containing 40 questions. How many questions must the student get right to pass?

70% of 40 = what

$\frac{70}{100} = \frac{x}{40}$ $\quad 70(40) = 100x$

$\frac{2800}{100} = \frac{100x}{100}$

$28 = x$

needs to answer 28 questions correct

20. Production increased from 1024 units per day to 1408 units per day over the year. What was the percent of increase in unit production over the year?

1024 to 1408

increased $\quad 1408 - 1024 = 384$

$\frac{384 \text{ increase}}{1024 \text{ original}} = \text{increase \%}$

$\frac{384}{1024} = \frac{x}{100}$

$\frac{38400}{1024} = \frac{1024x}{1024}$

$37.5 = x$

37.5%