proportions?

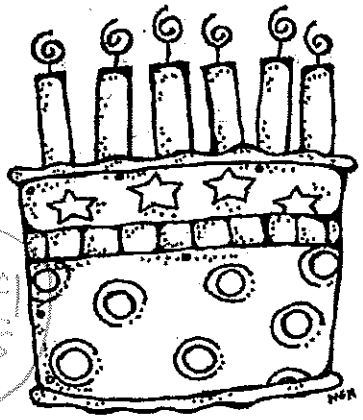
proportion - a set of 2 equivalent ratios.
* LABELS *

are they proportional?

1. common denominator
2. simplifying
3. UNIT RATE!

$\frac{4}{14} = \frac{2}{7}, \frac{6}{21}$ ARE PROPORTIONAL!

$\frac{1}{3} = \frac{8}{24}, \frac{6}{20} = \frac{3}{10}$ NOT PROPORTIONAL!



While making a cake for your birthday, you notice the recipe serves 8 people. Knowing that you will have 12 people at your party, you must increase each of the ingredients.

	8 servings	12 servings
flour	1.5 cups	2.25 cups
sugar	2 cups	3 cups

What is the ratio of flour to sugar for 8 servings? What about for 12 servings?

$\frac{1.5 \text{ f}}{2 \text{ s}} = \frac{.75 \text{ f}}{1 \text{ s}}$

Determine if the ratios are proportional by finding a common denominator.

$\frac{4.5}{6} = \frac{1.5 \text{ cf}}{2 \text{ cs}} = \frac{2.25 \text{ cf}}{3 \text{ cs}}$

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$$2\overline{)1.5}$$

12

$$\frac{2.25\,ft}{3\,s} = \frac{\quad ft}{1\,s}$$

$\div 3$

$\div 3$

$$3\overline{)2.25}$$

$\div 3$

$$\frac{2.25\,f}{3\,s} = \frac{.75\,f}{1\,s}$$

$\div 3$

$$\begin{array}{r} .75 \\ 3\overline{)2.25} \\ \underline{21} \\ 15 \end{array}$$

Ratios and proportions

Ratios are used to solve proportions, find similar lengths in similar figures, and to find / interpret the scale in a scale model, drawing, or map.

Ratios can be written 3 different ways.

$\frac{2}{5}$ 2 : 5 2 to 5

proportions can be solved by making equivalent fractions.

Example:

Seth drove 270 miles on 18 gallons of gas. At this rate, how many miles can he drive on 9 gallons of gas?

Step 1: identify terms (LABELS)
Step 2: fill in what you know
Step 3: solve. make equivalent fractions.

$$\frac{270 \text{ mi}}{18 \text{ gal}} = \frac{x \text{ mi}}{9 \text{ gal}} \qquad \div 2 \qquad \div 2$$

$$2\overline{)270} = 135$$

$\boxed{x = 135 \text{ miles}}$

Troy can run $\frac{1}{2}$ a mile in 4 mins. If he runs at a constant speed, how many miles can he run in 36 mins?

$\frac{1}{2} \times \frac{9}{1} = \frac{9}{2}$

$\frac{\frac{1}{2}\text{ mi}}{4\text{ min}} \quad \frac{x\text{ mi}}{36\text{ min}}$ (×9)

$x = 4\frac{1}{2}\text{ mi}$

$\times \frac{5}{9}$
4.5

Matt can make 6 flashcards in 8 mins. At this rate, how many flashcards can he make in 20 mins?

$\frac{3}{4}$ $\quad \frac{6\text{ fc}}{8\text{ min}} = \frac{x\text{ fc}}{20\text{ min}}$ (×5)

$x = 15$ flashcards

Name:_____ Date: _____ Class: _____

The Tricky Proportion / Rate Word Problem Challenge!

Some of these problems are tricky, some are not. This makes the tricky problems even trickier, since you don't know which ones are tricky! Follow the instructions for the problems below. **Show all your work.** Don't forget units! The winners get the thrill of knowing they are ratio/rate/proportion masters!

Use proportions to solve problems 1 - 4 below:

1. One day, Farmer Brown counts his chickens and his eggs. He finds the ratio of chickens to eggs is 7:12. If there are 77 chickens, how many eggs are there?

$\frac{7 \text{ ck}}{12 \text{ eggs}} = \frac{77 \text{ ck}}{x \text{ eggs}}$ $x = 132$ eggs

2. The ratio of laptop computers to desktop computers at a middle school is 8 to 5. If there are 40 desktop computers, how many computers are in the school?

3. The ratio of walnuts to milk chocolate chips in a recipe for chocolate chip brownies is 5 to 8. A particular batch of brownies has 35 walnuts in it. The sum of the number of walnuts, milk chocolate chips, and white chocolate chips in this batch is 123. How many white chocolate chips are there in this batch?

$123 = 35 + 56 + d$

$\frac{5 \text{ W}}{8 \text{ MC}} = \frac{35 \text{ W}}{x \text{ MC}}$ $123 = 91 + d$

$x = 56$ MC $-91 \quad -91$

$32 = d$

4. If the average tween complains about 13 things every two hours, how many hours will it take to reach 195 complaints?

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The Tricky Proportion / Rate Word Problem Challenge!

Use proportions to solve problems 5 - 8 below:

5. The ratio of cups of flour to cups of cooking oil in a cake mix is 3:8. The ratio of cups of cooking oil to cups of water is 6 to 5. There are $\frac{3}{4}$ cups of flour required. How many cups of water are required?

6. If the ratio of students with green shirts to total students in a class is 3 to 8, and are 12 students wearing green shirts, how many are there without green shirts?

7. At Betty's Bouncing Baby Care, the ratio of really dirty diapers to mildly dirty diapers used is 4 to 10. If there were 28 really dirty diapers used on a particular day, how many total diapers were used?

8. Assume the ratio of really dirty diapers to mildly dirty diapers at Betty's remains at 4 to 10. If there are 308 total diapers used in a 3-day period, how many of them are really dirty?

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