Solving Proportions

Solving a proportion is solving an equation of given ratios (Fractions)

• A proportion is when we have two things equal to one anther and one piece of information is unknown, ALGEBRA all over again

Example 1:

Solve the following proportions for a

$$\frac{a}{b} = \frac{c}{d} \rightarrow \frac{b \cdot a}{b} = \frac{c \cdot b}{d} \rightarrow a =$$
Multiply both sides by b

Pretty straight forward when the unknown is in the numerator. Just multiply by the denominator you are trying to find!

Example 2:

$$\frac{3}{5} = \frac{d}{60} \qquad \rightarrow \qquad \frac{60 \cdot 3}{5} = \frac{d \cdot \delta Q}{\delta Q} \qquad \rightarrow \qquad d = 36$$

It may seem harder when the unknown is in the denominator...

$$\frac{3}{5} = \frac{9}{d}$$

But since the two fractions are equal to one another, if you flip one fraction, you can flip the other!

$$\frac{3}{5} = \frac{9}{d} \quad \rightarrow \quad \frac{5}{3} = \frac{d}{9}$$

This we can solve easily, just multiply by the denominator we are trying to cancel

$$\frac{9\cdot 5}{3} = \frac{d\cdot 9}{9} \qquad \rightarrow \qquad \frac{45}{3} = d \qquad \rightarrow \qquad d = 15$$

Set up a proportion to solve each problem, show all work, and label all answers.

The ratio of boys to girls is 3 to 2. If there are 12 boys, how many girls are there?

$$\frac{3b}{2g} = \frac{12b}{xg}$$
 Flip 121/2g = $\frac{xq}{12b}$. 12b $x = 8gr/s$

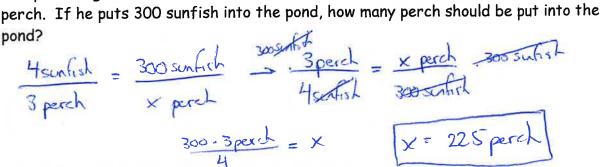
It takes one Super Giant Pizza to feed 3 people. If you invite 36 people, how many pizzas will you need?

3. At a recent party, it cost \$9.50 for refreshments for 10 guests. At this rate, how much would it cost to have refreshments for 80 guests?

$$\frac{\text{80 gusts}}{\text{10 gusts}} = \frac{\text{$1 \times 80 \text{ guests}}}{\text{$10 \times 100 \text{ gusts}}} \times \frac{\text{$10 \times 100 \text{ guests}}}{\text{$10 \times 100 \text{ gusts}}} \times \frac{\text{$10 \times 100 \text{ guests}}}{\text{$10 \times 100 \text{ gusts}}} \times \frac{\text{$10 \times 100 \text{ guests}}}{\text{$10 \times 100 \text{ guests}}} \times \frac{\text{$10 \times 100 \text{ guests}}}{\text{$10 \times 100 \text{ guests}}} \times \frac{\text{$10 \times 100 \text{ guests}}}{\text{$10 \times 100 \text{ guests}}} \times \frac{\text{$10 \times 100 \text{ guests}}}{\text{$10 \times 100 \text{ guests}}} \times \frac{\text{$10 \times 100 \text{ guests}}}{\text{$10 \times 100 \text{ guests}}} \times \frac{\text{$10 \times 100 \text{ guests}}}{\text{$10 \times 100 \text{ guests}}} \times \frac{\text{$10 \times 100 \text{ guests}}}{\text{$10 \times 100 \text{ guests}}} \times \frac{\text{$10 \times 100 \text{ guests}}}{\text{$10 \times 100 \text{ guests}}} \times \frac{\text{$10 \times 100 \text{ guests}}}{\text{$10 \times 100 \text{ guests}}} \times \frac{\text{$10 \times 100 \text{ guests}}}{\text{$10 \times 100 \text{ guests}}} \times \frac{\text{$10 \times 100 \text{ guests}}}{\text{$10 \times 100 \text{ guests}}} \times \frac{\text{$10 \times 100 \text{ guests}}}{\text{$10 \times 100 \text{ guests}}} \times \frac{\text{$10 \times 100 \text{ guests}}}{\text{$10 \times 100 \text{ guests}}} \times \frac{\text{$10 \times 100 \text{ guests}}}{\text{$10 \times 100 \text{ guests}}} \times \frac{\text{$10 \times 100 \text{ guests}}}{\text{$10 \times 100 \text{ guests}}} \times \frac{\text{$10 \times 100 \text{ guests}}}{\text{$10 \times 100 \text{ guests}}} \times \frac{\text{$10 \times 100 \text{ guests}}}{\text{$10 \times 100 \text{ guests}}} \times \frac{\text{$10 \times 100 \text{ guests}}}{\text{$10 \times 100 \text{ guests}}} \times \frac{\text{$10 \times 100 \text{ guests}}}{\text{$10 \times 100 \text{ guests}}} \times \frac{\text{$10 \times 100 \text{ guests}}}{\text{$10 \times 100 \text{ guests}}} \times \frac{\text{$10 \times 100 \text{ guests}}}{\text{$10 \times 100 \text{ guests}}} \times \frac{\text{$10 \times 100 \text{ guests}}}{\text{$10 \times 100 \text{ guests}}} \times \frac{\text{$10 \times 100 \text{ guests}}}{\text{$10 \times 100 \text{ guests}}} \times \frac{\text{$10 \times 100 \text{ guests}}}{\text{$10 \times 100 \text{ guests}}} \times \frac{\text{$10 \times 100 \text{ guests}}}{\text{$10 \times 100 \text{ guests}}} \times \frac{\text{$10 \times 100 \text{ guests}}}{\text{$10 \times 100 \text{ guests}}} \times \frac{\text{$10 \times 100 \text{ guests}}}{\text{$10 \times 100 \text{ guests}}} \times \frac{\text{$10 \times 100 \text{ guests}}}{\text{$10 \times 100 \text{ guests}}} \times \frac{\text{$10 \times 100 \text{ guests}}}{\text{$10 \times 100 \text{ guests}}} \times \frac{\text{$10 \times 100 \text{ guests}}}{\text{$10 \times 100 \text{ guests}}} \times \frac{\text{$10 \times 100 \text{ guests}}}{\text{$10 \times 100 \text{ guests}}} \times \frac{\text{$10 \times 100 \text{ guests}}}{\text{$10 \times 100 \text{ guests}}} \times \frac{\text{$10 \times 100 \text{ guests}}}{\text{$10 \times 100 \text{ guests}}} \times \frac{\text{$10 \times 100 \text{ guests}}}{\text{$10 \times 100 \text{ guests}}} \times \frac{\text{$10 \times 100 \text{ gues$$

4. Mary has saved \$17.50 in the past 3 weeks. At this rate, how much will she save in 15

5. Mr. Johnson was paid \$190 for a job that required 40 hours of work. At this rate, how much should he be paid for a job requiring 60 hours of work?



The park ranger stocks the children's fishing pond keeping a ratio of 4 sunfish to 3

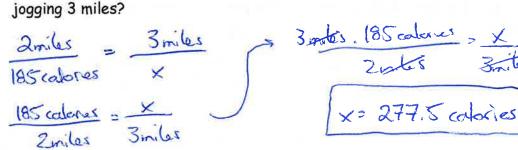
7. If two pounds of meat will serve 5 people, how many pounds will be needed to serve 13 people?

8. Jack was planting a tree. He was to dig a hole that was 3 feet deep for every 5 feet of tree height. How deep should he dig the hole for a tree that is 17 feet high?

9. A certain shade of green paint is made from 5 parts yellow mixed with three parts blue. If 2 cans of yellow are used, how many cans of blue should be used?

10. If a 4-pound roast takes 150 minutes to cook, how long should a five-pound roast take?

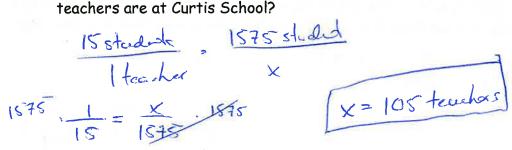
$$\frac{41los}{150mins} = \frac{51los}{x}$$
 $5 \cdot \frac{150}{4} = \frac{x}{5} \cdot 5$
 $x = 187.5 mins$



11. If a jogger runs 2 miles and burns 185 calories, how many calories would he burn

12. The ratio of the cost of a tennis racket to tennis balls is 18:1. If a can of balls cost \$5.35, what is the cost of the racket?

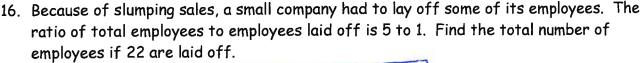
13. Curtis School has 1,575 students. The student to teacher ratio is 15 to 1. How many teachers are at Curtis School?



14. A recipe calls for $2\frac{1}{2}$ cups of flour to make 2 dozen cookies. How many cups of flour would be required to bake 15 dozen cookies?

15. A meteorologist reports that the ratio of snowfall in January to total snowfall during the average winter is 2 to 5. If 34 inches have fallen in January of the current year, find the predicted total snowfall for the entire winter.

$$\frac{2}{5} = \frac{34}{x}$$
 $34. \frac{5}{2} = \frac{x}{34}.34$
 $x = 85$ in



$$22.5 = \frac{\times}{12}$$
 $\times = 110$ employees

17. A crew of loggers cleared $\frac{1}{2}$ acre of lumber in 4 days. How long will it take the same crew to clear $2\frac{3}{4}$ acres of lumber?

$$\frac{0.5}{4} = \frac{2.75}{4}$$
2.75. $\frac{4}{0.5} = \frac{\times}{2.75}$
 $\times = 22 \text{ days}$

18. A person who weighs 200 pounds on Earth would weigh about 32 pounds on the moon. Find the weight of a person on Earth who would weigh 15 pounds of the moon.

19. A pump can fill a 750-gallon tank in 35 minutes. How long will it take to fill a 1000-gallon tank with this same pump?

20. In a public opinion poll, 624 people from a sample of 1,100 indicated they would vote for a specific candidate. How many votes can the candidate expect to receive from a population of 40,000?

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