

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

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

$$\frac{3 \text{ boys}}{2 \text{ girls}} = \frac{12 \text{ boys}}{x \text{ girls}} \quad 3x = 2 \cdot 12 \quad x = 8 \text{ girls}$$

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

$$\frac{1 \text{ pizza}}{3 \text{ people}} = \frac{x}{36 \text{ people}} \quad 1 \cdot 36 = 3x \quad \frac{36}{3} = \frac{3x}{3} \quad 12 = x \quad 12 \text{ pizzas}$$

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?

$$\frac{\$9.50}{10 \text{ people}} = \frac{x}{80 \text{ people}} \quad 10x = 9.50 \cdot 80 \quad x = \$76$$

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

$$\frac{\$17.50}{3 \text{ weeks}} = \frac{x}{15 \text{ weeks}} \quad 15 \cdot 17.50 = 3x \quad \frac{262.5}{3} = \frac{3x}{3} \quad \$87.50 = x$$

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?

$$\frac{\$190}{40 \text{ hrs}} = \frac{x}{60 \text{ hrs}} \quad 190 \cdot 60 = 40x \quad \frac{11400}{40} = \frac{40x}{40} \quad \$285 = x$$

6. The park ranger stocks the children's fishing pond keeping a ratio of 4 sunfish to 3 perch. If he puts 300 sunfish into the pond, how many perch should be put into the pond?

$$\frac{4 \text{ sunfish}}{3 \text{ perch}} = \frac{300 \text{ sunfish}}{x \text{ perch}} \quad 4x = 3 \cdot 300 \quad \frac{4x}{4} = \frac{900}{4} \quad x = 225 \quad 225 \text{ perch}$$

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

$$\frac{2 \text{ lbs. meat}}{5 \text{ people}} = \frac{x}{13 \text{ people}} \quad 2 \cdot 13 = 5x \quad \frac{26}{5} = \frac{5x}{5} \quad x = 5\frac{1}{5} = 5.2 \text{ lbs of meat}$$

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?

$$\frac{3 \text{ ft depth}}{5 \text{ ft height}} = \frac{x}{17 \text{ ft height}} \quad 5x = 3 \cdot 17 \quad \frac{5x}{5} = \frac{51}{5} \quad x = 10\frac{1}{5} = 10.2 \text{ ft deep}$$

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?

$$\frac{5 \text{ parts yellow}}{3 \text{ parts blue}} = \frac{2 \text{ cans}}{x} \quad 5x = 3 \cdot 2 \quad \frac{5x}{5} = \frac{6}{5} \quad x = 1\frac{1}{5} = 1.2 \text{ cans of blue}$$

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

$$\frac{4 \text{ lb}}{150 \text{ min}} = \frac{5 \text{ lb}}{x \text{ min}} \quad 4x = 5 \cdot 150 \quad \frac{4x}{4} = \frac{750}{4} \quad x = 187.5 \text{ minutes}$$

11. If a jogger runs 2 miles and burns 185 calories, how many calories would he burn jogging 3 miles?

$$\frac{2 \text{ miles}}{185 \text{ cal}} = \frac{3 \text{ miles}}{x}$$

$$\begin{aligned} 2x &= 3 \cdot 185 \\ \frac{2x}{2} &= \frac{555}{2} \end{aligned}$$

$$x = 277.5 \text{ calories}$$

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?

$$\frac{18 \text{ racket}}{1 \text{ ball}} = \frac{x}{5.35}$$

$$\begin{aligned} 18 \cdot 5.35 &= 1x \\ 96.3 &= 1x \end{aligned}$$

$$\$96.30$$

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

$$\frac{15 \text{ student}}{1 \text{ teacher}} = \frac{1575 \text{ students}}{x \text{ teacher}}$$

$$\frac{15x}{15} = \frac{1575 \cdot 1}{15}$$

$$x = 105 \text{ teachers}$$

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?

$$\frac{2\frac{1}{2} \text{ c flour}}{2 \text{ dozen}} = \frac{x}{15 \text{ dozen}}$$

$$\begin{aligned} 2\frac{1}{2} \cdot 15 &= 2x \\ 37.5 &= \frac{2x}{2} \end{aligned}$$

$$\begin{aligned} x &= 18.75 \\ 18\frac{3}{4} \text{ c flour} \end{aligned}$$

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.

$$\frac{\text{Jan } 2}{\text{Winter } 5} = \frac{34}{x}$$

$$\begin{aligned} 2 \cdot x &= 5 \cdot 34 \\ \frac{2x}{2} &= \frac{170}{2} \end{aligned}$$

$$x = 85 \text{ inches}$$

16. Because of slumping sales, a small company had to lay off some of its employees. The ratio of total employees to employees laid off is 5 to 1. Find the total number of employees if 22 are laid off.

$$\frac{\text{total } 5}{\text{layoff } 1} = \frac{x}{22}$$

$$\begin{aligned} 5 \cdot 22 &= 1x \\ 110 &= 1x \end{aligned}$$

$$110 \text{ total employees}$$

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?

$$\frac{\frac{1}{2} \text{ acre}}{4 \text{ days}} = \frac{2\frac{3}{4}}{x}$$

$$\begin{aligned} \frac{1}{2}x &= 2\frac{3}{4} \cdot 4 \\ \frac{1}{2}x &= 11 \\ \frac{\frac{1}{2}x}{\frac{1}{2}} &= \frac{11}{\frac{1}{2}} \end{aligned}$$

$$x = 22 \text{ days}$$

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 on the moon.

$$\frac{\text{Earth } 200}{\text{Moon } 32} = \frac{x}{15}$$

$$\begin{aligned} 200 \cdot 15 &= 32x \\ \frac{3000}{32} &= \frac{32x}{32} \end{aligned}$$

$$x = 93.75 \text{ lbs on Earth}$$

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?

$$\frac{750 \text{ gal}}{35 \text{ min}} = \frac{1000 \text{ gal}}{x}$$

$$\begin{aligned} 750x &= 35 \cdot 1000 \\ 750x &= 35000 \\ \frac{750x}{750} &= \frac{35000}{750} \end{aligned}$$

$$x = 46\frac{2}{3} = 46.6 \text{ min}$$

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?

$$\frac{624 \text{ people}}{1100 \text{ total sample}} = \frac{x}{40000}$$

$$\begin{aligned} 624 \cdot 40000 &= 1100x \\ \frac{24,960,000}{1100} &= \frac{1100x}{1100} \end{aligned}$$

$$22690\frac{10}{11} \approx 22691 \text{ votes}$$