

Helpful Hint: Write proportions so your unknown (what you are solving for) is in the numerator (on top).

Proportions Practice

For each problem, make a key. Then write the proportion and solve. Be sure to include units in your answer.

- 1.) Three pumps can remove a total of 1700 gallons of water per minute from a flooded mineshaft. If engineers want to remove at least 5500 gallons per minute, how many pumps will they need operating?

$$\frac{\text{\# of pumps}}{\text{gallons/min}}$$

$$\frac{(5500)}{1} \cdot \frac{3}{1700} = \frac{X}{5500} \cdot \frac{(5500)}{1}$$

$$9.7 = X$$

They will need ten pumps working.

- 2.) Geologists in Antarctica find an average of 7 meteorite fragments in every 500 tons of gravel they sift through. How much gravel must they sift through in order to get 100 fragments?

$$\frac{\text{tons of gravel}}{\text{\# of fragments}}$$

$$\frac{(100)}{7} \cdot \frac{500}{1} = \frac{X}{100} \cdot \frac{(100)}{1}$$

$$7142.9 = X$$

They must sift through 7142.9 tons of gravel.

- 3.) The ratio of boys to girls in Ms. Alper's math classes is 5 : 7. If there are 60 students in all of her classes, how many are boys?

5:7

There are 5 boys for every 7 girls.
5 boys out of 12 total.

$$\frac{\text{Boys}}{\text{Total Kids}}$$

$$\frac{(60)}{12} \cdot \frac{5}{60} = \frac{X}{60} \cdot \frac{(60)}{1}$$

$$25 = X$$

There would be 25 boys in a class of 60.

- 4.) A cookie recipe calls for 3 eggs and makes 4 dozen cookies.

- a. How many (dozen) cookies could you make with a dozen eggs?

$$\frac{\text{Dozen Cookies}}{\text{\# of eggs}}$$

$$\frac{(12)}{3} \cdot \frac{4}{12} = \frac{X}{12} \cdot \frac{(12)}{1}$$

$$16 = X$$

You can make 16 dozen cookies with one dozen (12) eggs.

- b. How many eggs would you need to make 18 dozen cookies?

$$\frac{\text{\# of eggs}}{\text{dozen cookies}}$$

$$\frac{(18)}{4} \cdot \frac{3}{18} = \frac{X}{18} \cdot \frac{(18)}{1}$$

$$13.5 = X$$

You will need 13.5 eggs to make 18 dozen cookies.

Notice how the ratios are flipped based on the problem.

5.) A case of 24 tennis balls weighs 3 pounds. How much would a shipment of 2560 tennis balls weigh?

$$\frac{\text{weight}}{\text{tennis balls}}$$

$$(2560) \frac{3}{24} = \frac{x}{2560} \quad (2560)$$

$$320 = x$$

2560 tennis balls weigh 320 pounds.

6.) A map of Connecticut is drawn to a scale where 2 inches on the map represents 35 miles.

a. If Greenwich and Stonington are 105 miles from each other, how far apart do they appear on the map?

$$\frac{\text{inches}}{\text{mile}}$$

$$(105) \frac{2}{35} = \frac{x}{105} \quad (105)$$

$$6 = x$$

Greenwich and Stonington are 6 inches apart on the graph.

b. On this same map the road from Mystic to Hartford is 1½ inches long. How far apart are Mystic and Hartford?

$$\frac{\text{mile}}{\text{inch}}$$

$$(1.5) \frac{35}{2} = \frac{x}{1.5} \quad (1.5)$$

$$26.25 = x$$

Mystic and Hartford are 26.25 miles apart.

7.) A bag of 8 apples costs \$1.50 at Sam's Orchard.

a. At this same rate, how much would 18 apples cost?

$$\frac{\text{cost}}{\text{\# of apples}}$$

$$(18) \frac{1.5}{8} = \frac{x}{18} \quad (18)$$

$$3.375 = x$$

18 apples would cost approximately \$3.38.

b. How many apples could you buy for \$5.00?

$$\frac{\text{\# of apples}}{\text{cost}}$$

$$(5) \frac{8}{1.5} = \frac{x}{5} \quad (5)$$

$$26.7 = x$$

You could buy about 27 apples for \$5.

c. What is the unit cost per apple?

$$\frac{\text{cost}}{\text{\# of apples}}$$

$$\frac{1.5}{8} = \frac{x}{1}$$

$$0.19 = x$$

One apple costs 19 cents.

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8.) Emily can ride her scooter 18 miles in 50 minutes.

120 minutes

a. At this same rate (speed) how far can she ride in two hours?

$$\frac{\text{miles}}{\text{minute}}$$

$$(120) \frac{18}{50} = \frac{x}{120}$$

$$43.2 = x$$

She can ride 43.2 miles in 2 hours.

b. How long would it take for her to ride 4 miles?

$$\frac{\text{minutes}}{\text{miles}}$$

$$(4) \frac{50}{18} = \frac{x}{4}$$

$$11.1 = x$$

It would take 11.1 minutes to ride 4 miles.

c. What is her unit rate in miles per hour?

$$\frac{\text{miles}}{\text{minute}}$$

$$(60) \frac{18}{50} = \frac{x}{60}$$

$$21.6 = x$$

60 minutes = 1 hour

The unit rate is 21.6 miles per hour.

Notice how the ratios are flipped based on the problem.

9.) Will's Widget Works can produce 2½ tons of widgets in an 8 hour work day.

a. How many widgets can Will's Widget Works produce between 9 am and noon?

3 hours

$$\frac{\text{tons of widgets}}{\text{hours}}$$

$$(3) \frac{2.5}{8} = \frac{x}{3}$$

$$0.94 = x$$

They would produce 0.94 tons of widgets.

b. McGee Manufacturing, Inc. needs to order 17 tons of widgets. How many work days will it take Will's Widget works to fill this order?

$$\frac{\text{hours}}{\text{tons of widgets}}$$

$$(17) \frac{8}{2.5} = \frac{x}{17}$$

total hours → $54.4 = x$

$$54.4 \div 8 = 6.8 \text{ work days}$$

It would take 6.8 8-hour work days to fill the order.

Notice how the ratios are flipped based on the problem.

- 10.) The Jakobshavn Glacier in Greenland, reputed to be the fastest in the world, has sped up lately (perhaps due to global warming?). The last accurate measurements have it travelling at 5.25 kilometers (5250 meters) in a five month period. At this rate, how far does it travel in a year?

km
month

$$(12) \frac{5.25}{5} = \frac{x}{12} \quad (12)$$

12 months = 1 year

$$12.6 = x$$

At this rate, the glacier would travel 12.6 km in one year.