

Connect Proportions to Real-World Situations

Brenda Meery
Jen Kershaw

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AUTHORS

Brenda Meery

Jen Kershaw

4.5 Connect Proportions to Real-World Situations

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[Figure 1]

Robbie went to the store to buy hamburgers for the family barbeque. The hamburgers were on sale for \$3.99 for 4 burgers. Robbie needed 22 burgers for the barbeque. How much money did he spend?

In this concept, you will learn how to use proportions in real-world situations.

Proportions

Proportions can be found in many real-world situations. You use proportions for many situations that you may not even be aware of. Let's take a look at a situation where a **proportion** can be used to solve a real-world dilemma.

Amanda read 18 pages in 23 minutes. At this **rate**, how many pages will she read in 45 minutes?

First, write your proportion.

$$\frac{18}{23} = \frac{x}{45}$$

Next, cross multiply.

$$\begin{aligned}\frac{18}{23} &= \frac{x}{45} \\ 23x &= 18 \times 45 \\ 23x &= 810\end{aligned}$$

Then, solve for x by dividing both sides by 23.

$$\begin{aligned}23x &= 810 \\ \frac{23x}{23} &= \frac{810}{23} \\ x &= 35.217\end{aligned}$$

The answer is 35.2.

Amanda will read 35 pages in 45 minutes.

Let's look at another example.

John ate three hot dogs in six minutes. At this rate, how many will he eat in twelve minutes?

First, write your proportion.

$$\frac{3}{6} = \frac{x}{12}$$

Next, cross multiply.

$$\begin{aligned}\frac{3}{6} &= \frac{x}{12} \\ 6x &= 3 \times 12 \\ 6x &= 36\end{aligned}$$

Then, solve for x by dividing both sides by 6.

$$\begin{aligned}6x &= 36 \\ \frac{6x}{6} &= \frac{36}{6} \\ x &= 6\end{aligned}$$

The answer is 6.

John will eat 6 hotdogs in 12 minutes.

Examples

Example 1

Earlier, you were given a problem about Robbie's yummy purchase?

Robbie needs to figure out how much money he is going to spend on burgers. He needs 22 in total and it costs \$3.99 for 4.

First, write your proportion.

$$\frac{3.99}{4} = \frac{x}{22}$$

Next, cross multiply.

$$\begin{aligned}\frac{3.99}{4} &= \frac{x}{22} \\ 4x &= 22 \times 3.99 \\ 4x &= 87.78\end{aligned}$$

Then, solve for x by dividing both sides by 4.

$$\begin{aligned}4x &= 87.78 \\ \frac{4x}{4} &= \frac{87.78}{4} \\ x &= 21.95\end{aligned}$$

The answer is 21.95.

Robbie will spend \$21.95 on the 22 burgers he needs.

Example 2

Kelvin measured the **distance** from his door to the park. It is 1.5 miles. The distance from Kelvin's house to the library is twice the distance from Kelvin's door to the park. How far is it from Kelvin's to the library?

First, write your proportion.

$$\frac{1}{1.5} = \frac{2}{x}$$

Next, cross multiply.

$$\begin{aligned}\frac{1}{1.5} &= \frac{2}{x} \\ 1x &= 1.5 \times 2 \\ x &= 3\end{aligned}$$

The answer is 3.

It is three miles from Kelvin's house to the library.

Example 3

Carmen ran one mile in 7 minutes. At this rate, how long will it take her to **run** 5 miles?

First, write your proportion.

$$\frac{1}{7} = \frac{5}{x}$$

Next, cross multiply.

$$\begin{aligned}\frac{1}{7} &= \frac{5}{x} \\ 1x &= 7 \times 5 \\ x &= 35\end{aligned}$$

The answer is 35.

It will take 35 minutes to run 5 miles.

Example 4

Jack bought 5 oranges for \$3.99. What was the cost for one orange?

First, write your proportion.

$$\frac{3.99}{5} = \frac{x}{1}$$

Next, cross multiply.

$$\begin{aligned}\frac{3.99}{5} &= \frac{x}{1} \\ 5x &= 1 \times 3.99 \\ 5x &= 3.99\end{aligned}$$

Then, solve for x by dividing both sides by 5.

$$\begin{aligned}5x &= 3.99 \\ \frac{5x}{5} &= \frac{3.99}{5} \\ x &= 0.798\end{aligned}$$

The answer is 0.798.

One orange costs \$0.80 or 80¢.

Example 5

Jessie read three books in one week. At this rate, how many books will she read in 3 weeks?

First, write your proportion.

$$\frac{3}{1} = \frac{x}{3}$$

Next, cross multiply.

$$\begin{aligned}\frac{3}{1} &= \frac{x}{3} \\ 1x &= 3 \times 3 \\ x &= 9\end{aligned}$$

The answer is 9.

Jessie will read 9 books in 3 weeks.

Review

Write a proportion and use equivalent ratios to solve the following problems.

1. Marco makes \$25 for every 2 hours he works. If he works for 12 hours, how much will he make?
2. If Marco works for 6 hours, how much will he make?
3. If Marco works for 4 hours, how much will he make?
4. If Marco made \$50 for every 2 hours he works, how much will he make in 10 hours?
5. Corinne runs 2.8 miles in 30 minutes. If she runs for 150 minutes this week, how many miles will she have run?
6. If she runs 300 minutes, how many miles will she run?
7. Adam drives 45 miles per hour. If he drives for 3.5 hours, how many miles will he have driven?
8. If he drives 7 hours, how many miles will he have driven?

Use cross-multiplying and proportions to solve the following problems. Round to the nearest hundredths place where necessary.

9. Marni buys 2.5 pounds of grapefruit for \$4.48. To the nearest cent, how much would 6 pounds of grapefruit cost?
10. Sarah buys 3 pounds of bananas for \$2.50. What is the cost for bananas per pound?
11. Glenn can make 8 flyers in 35 minutes. How long will it take him to make 50 flyers?
12. At this rate, how many flyers could Glenn make in 70 minutes?
13. How many in two hours?
14. A store sells 21 pieces of clothing every 45 minutes. How long will it take the store to sell 100 pieces of clothing?


15. The basketball team scored 85 points in the last 2 games. How many points can they expect to score after 5 games?

Review (Answers)

To see the review answers, return to the [Table of Contents](#) and select 'Other Versions' or 'Resources'.

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