

Write your questions here!

In a proportion, a cross product is the product of the numerator of one ratio and the denominator of the other ratio. The following property involving cross products can be used to solve proportions:

Focused on Learning
 Listen with Headphones
 Interact with Notes
 Practice to Learn
 Problems Checked
 Evaluate your Answers
 Don't Test until You're Ready!

KEY CONCEPT*For Your Notebook***Cross Products Property**

Words The cross products of a proportion are equal.

Example $\frac{3}{4} = \frac{6}{8}$ 

Algebra If $\frac{a}{b} = \frac{c}{d}$ where $b \neq 0$ and $d \neq 0$, then $ad = bc$.

How we will do it:



Examples:

$$\frac{3k}{27} = \frac{2}{3}$$

$$\frac{7}{3} = \frac{2x + 5}{x}$$

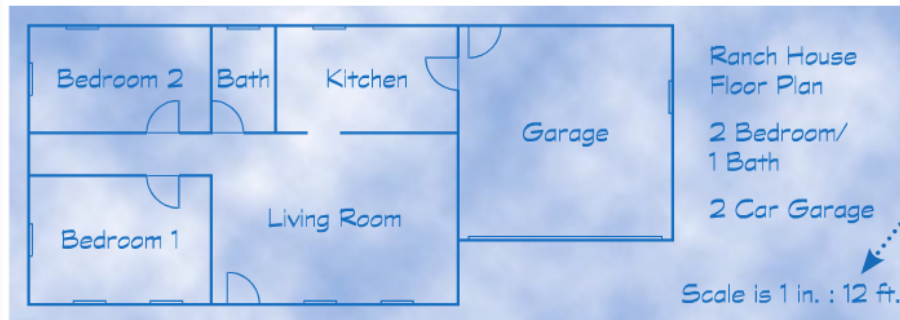
$$\frac{6}{4 + 2w} = -\frac{2}{w - 10}$$

You try 2:

$$\frac{d + 1}{4} = \frac{3d + 6}{7}$$

$$\frac{c - 8}{-2} = \frac{11 - 4c}{11}$$

SCALE DRAWINGS AND SCALE MODELS The floor plan below is an example of a *scale drawing*. A **scale drawing** is a two-dimensional drawing of an object in which the dimensions of the drawing are in proportion to the dimensions of the object. A **scale model** is a three-dimensional model of an object in which the dimensions of the model are in proportion to the dimensions of the object.



A scale should be written as
scale measure:
actual measure.

Use a metric ruler to estimate the distance from Cincinnati, Ohio to Cleveland:



You Try! The ship model kits sold at a hobby store have a scale of 1 ft : 600 ft. A completed model of the Queen Elizabeth II is 1.6 feet long. Estimate the actual length of the Queen Elizabeth II.

Now, summarize
your notes here!

Practice 4.2

SOLVING PROPORTIONS. Solve the proportion.

1. $\frac{2}{3} = \frac{4}{x}$

2. $\frac{13}{6} = \frac{52}{z}$

3. $\frac{5m}{6} = \frac{10}{12}$

4. $-\frac{49}{7} = \frac{a+7}{6}$ (Hint: Put the - sign in the top!)

5. $\frac{8}{12} = \frac{r}{r+1}$

6. $\frac{11}{w} = \frac{33}{w+24}$

7. $\frac{24}{5z+4} = \frac{4}{z-1}$

8. $\frac{k-8}{7+k} = -\frac{1}{5}$ (Hint: Put the - sign in the top!)

9. $\frac{m+1}{4} = \frac{3m+6}{7}$

10. $\frac{n + 0.3}{n - 3.2} = \frac{9}{2}$

11. $\frac{4}{b - 3.9} = \frac{2}{b + 1}$

4.2 Review Skillz

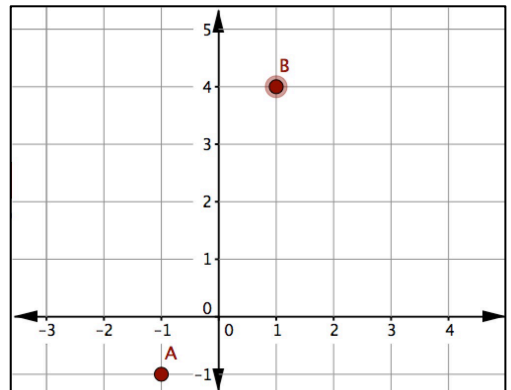
1. Solve:

$$-8 - \frac{x}{5} = -10$$

2. Simplify:

$$-5 - (-4x - 2)$$

3. Describe how to move from Point A to Point B:



_____ units in the y direction

_____ units in the x direction

4. Solve:

$$-18 - 2x = -10$$

5. Simplify:

$$12 - 3x = 15$$

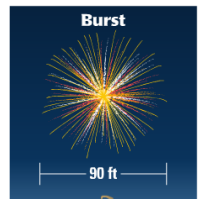
6. Describe how to move from point C(3, -1) to Point D(-3, 3):

Application 4.2

1. Solve for x: $\frac{2}{x - 1} = \frac{12}{5x + 4}$

2. Solve for x: $\frac{14}{3} = \frac{4x + 10}{x}$

3. **Fireworks!** The diameter of the burst of firework is proportional to the diameter of the shell of the firework.



a. Use the information (90 ft burst: 2 in shell) to find the burst diameter for a 4.75 inch shell.

b. Make a table of burst diameters for 2, 3, 4, 5, and 6 inch shells. Use your answer to check part (a).

Shell Diameter	2	3		4.75		6
Burst Diameter						

4. **Like!** It took 7.2 minutes to upload 8 digital pictures from your computer to Facebook. At this rate, how long will it take to upload 20 photographs.

5. **Scale Model.** An exhibit at DoDEA-Europe headquarters in Sembach included a scale model of the new Kaiserslautern High School being built on Vogelweh Kaserne. The model was built using a scale of 1 cm : 18 inches. Find the height of the new school in feet, if the model is 30 cm tall at its highest point.

6. During the summer, Mr. Brust does a lot of napping (and snoring)! In a typical nap, Mr. Brust will snore on average 320 times (or the ratio of naps to snores is 1 nap : 320 snores). Find the total number of times Mr. Brust snored last summer during naps in July and August if he took one nap everyday.

