

# Inverse Variation

An **Inverse Variation** is a specific relationship in which there is a constant \_\_\_\_\_ between all ordered pairs.

**Inverse Variation Equations** are written in the form

## Finding the Constant (k)

Identify the constant of the ordered pairs below.  
Then, write the equation to represent the relationship.

1)  $\{(1, 20), (2, 10), (4, 5)\}$

2)  $\{(1, -28), (2, -14), (4, -7)\}$

3)

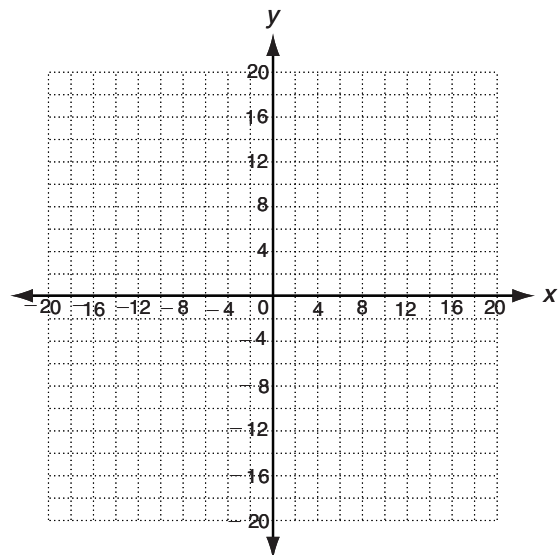
$x$	$y$
-5	2.4
-3	4
-2	6
-1	12

4)

$x$	-0.5	-1	-1.5	-2
$y$	-12	-6	-4	-3

## Graphing Inverse Variation

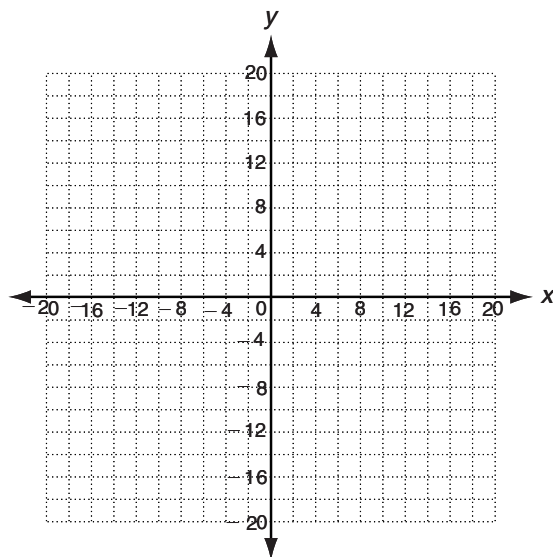
If the constant of an inverse variation is **16**, create a table of values to graph the relationship.



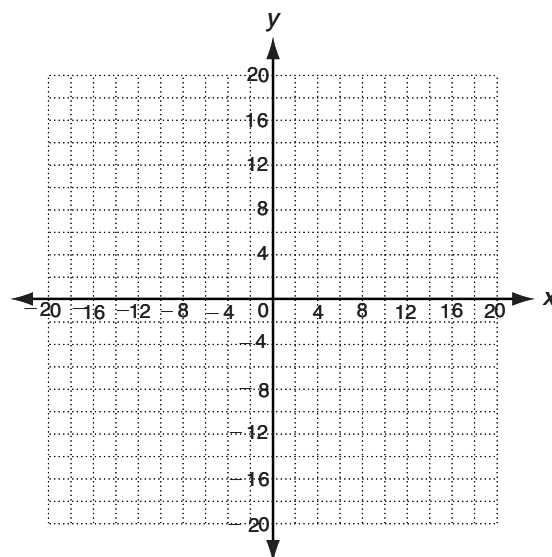
## More Examples

Graph the equations below by creating a table of values.

5) Constant of Variation: 24



6) Constant of Variation: -36



Finding Missing Values	If the following ordered pairs represent an inverse variation, find the missing value.
7) $(12, 14)$ and $(-24, y)$	8) $(6, -10)$ and $(3, y)$
9) $(9, y)$ and $(-18, 6)$	10) $(x, -7)$ and $(21, -3)$
11) If $y = 9$ when $x = -6$ , find $x$ when $y = 3$	12) If $y = 16$ when $x = -3$ , find $x$ when $y = -6$
13) If $y = 12$ when $x = -6$ , find $x$ when $y = -24$	14) If $y = -8$ when $x = -7$ , find $y$ when $x = -4$

## inverse variation examples

- 7.** Time traveling varies inversely with the average speed. If a train travels between two cities in 3 hours at an average speed of 65 miles per hour, how long would it take at an average speed of 78 miles per hour?
- 8.** A company that produces laptops has determined that the number of laptops it can sell varies inversely to the price of the laptop. Two thousand laptops can be sold when the price is \$2,500. How many laptops can be sold if the price of the laptop is \$1,000?
- 9.** The width of a rectangle varies inversely with its length. If the width is 4 when the length is 18, find the width when the length is 8.
- 10.** The number of workers varies inversely with the time in days to complete a project. Five workers can complete a certain project in 24 days. How many workers will be needed to complete the project in 15 days?
- 11.** The time it takes to bake a turkey varies inversely with the oven temperature. If it takes 3 hours to bake a turkey at 300 degrees, find the constant of variation.
- 12.** The cost per person to rent a cottage in the Outer Banks is inversely proportional to the number of people who share the rent. If 7 people share and it costs \$42 per person, find the constant of variation