

Inverse Variation

An Inverse Variation is a specific relationship in which there is a constant product ($x \cdot y$) between all ordered pairs.

Inverse Variation Equations are written in the form

$$y = \frac{k}{x}$$

Finding the Constant (k)

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

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

$$k = 1 \cdot 20 = 20$$

$$y = \frac{20}{x}$$

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

$$k = 1 \cdot -28 = -28$$

$$y = \frac{-28}{x}$$

3)

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

$$k = -3 \cdot 4 = -12$$

$$y = \frac{-12}{x}$$

4)

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

$$k = -1 \cdot -6 = 6$$

$$y = \frac{6}{x}$$

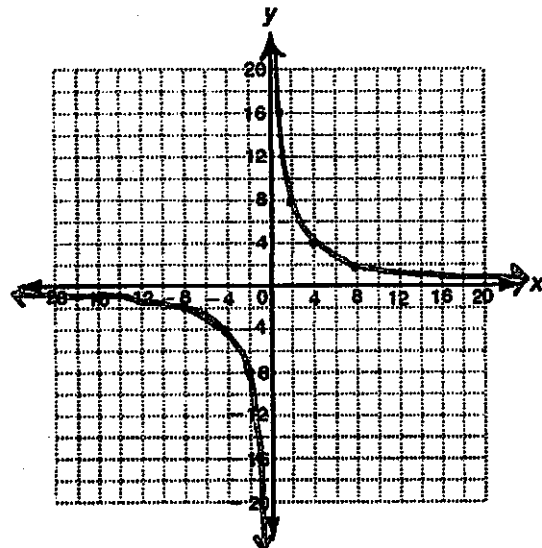
Graphing Inverse Variation

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

$$x \cdot y = 16$$

x	y
1	16
2	8
4	4
8	2
16	1

x	y
-1	-16
-2	-8
-4	-4
-8	-2
-16	-1

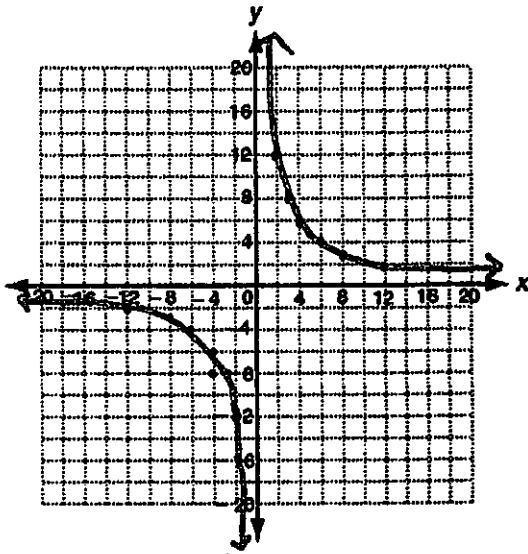


More Examples

Graph the equations below by creating a table of values.

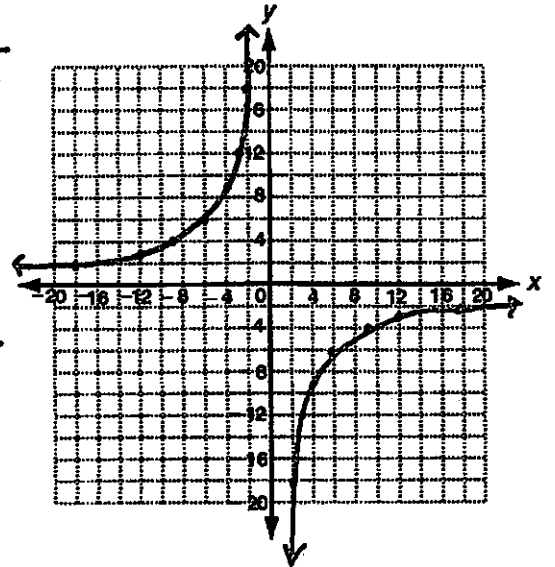
5) Constant of Variation: 24

X	Y	X	Y
1	24	-1	-24
2	12	-2	-12
3	8	-3	-8
4	6	-4	-6
6	4	-6	-4
8	3	-8	-3
12	2	-12	-2
24	1	-24	-1



6) Constant of Variation: -36

X	Y	X	Y
-1	36	1	-36
-2	18	2	-18
-3	12	3	-12
-4	9	4	-9
-6	6	6	-6
-9	4	9	-4
-12	3	12	-3
		18	-2



Finding Missing Values	If the following ordered pairs represent an inverse variation, find the missing value.	
7) (12, 14) and (-24, y) $12 \cdot 14 = -24y$ $168 = -24y$	$y = -7$	8) (6, -10) and (3, y) $6 \cdot -10 = 3 \cdot y$ $-60 = 3y$
9) (9, y) and (-18, 6) $9 \cdot y = -18 \cdot 6$ $9y = -108$	$y = -12$	10) (x, -7) and (21, -3) $x \cdot -7 = 21 \cdot -3$ $-7x = -63$
11) If y = 9 when x = -6, find x when y = 3 $9 \cdot -6 = x \cdot 3$ $-54 = 3x$	$x = -18$	12) If y = 16 when x = -3, find x when y = -6 $16 \cdot -3 = x \cdot -6$ $-48 = -6x$
13) If y = 12 when x = -6, find x when y = -24 $12 \cdot -6 = x \cdot -24$ $-72 = -24x$	$x = 3$	14) If y = -8 when x = -7, find y when x = -4 $-8 \cdot -7 = y \cdot -4$ $56 = -4y$