EXAMPLE 2 Graph an inverse variation equation

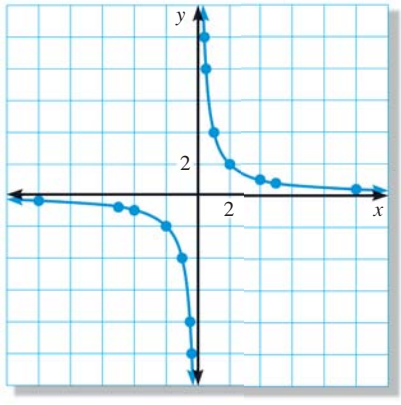
Graph $y = \frac{4}{x}$.

Solution

STEP 1 **Make** a table by choosing several integer values of x and finding the values of y. Then plot the points. To see how the function behaves for values of x very close to 0 and very far from 0, make a second table for such values and plot the points.

x	y
−4	−1
−2	−2
−1	−4
0	undefined
1	4
2	2
4	1

x	y
−10	−0.4
−5	−0.8
−0.5	−8
−0.4	−10
0.4	10
0.5	8
5	0.8
10	0.4



AVOID ERRORS
Note that y is undefined when $x = 0$. There is no point $(0, y)$ on the graph of $y = \frac{4}{x}$.

STEP 2 **Connect** the points in Quadrant I by drawing a smooth curve through them. Repeat for the points in Quadrant III.

GRAPHS OF INVERSE VARIATION As shown in Example 2, as you move away from the origin along the x-axis, the graph of an inverse variation equation approaches the x-axis without crossing it. As you move away from the origin along the y-axis, the graph approaches the y-axis without crossing it.

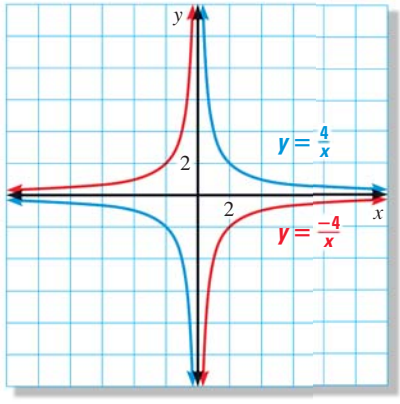
EXAMPLE 3 Graph an inverse variation equation

Graph $y = \frac{-4}{x}$.

Solution

COMPARE GRAPHS
The graph of an inverse variation equation lies in Quadrants I and III if $a > 0$, and the graph lies in Quadrants II and IV if $a < 0$.

Notice that $y = \frac{-4}{x} = -1 \cdot \frac{4}{x}$. So, for every nonzero value of x, the value of y in $y = \frac{-4}{x}$ is the opposite of the value of y in $y = \frac{4}{x}$. You can graph $y = \frac{-4}{x}$ by reflecting the graph of $y = \frac{4}{x}$ (see Example 2) in the x-axis.



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