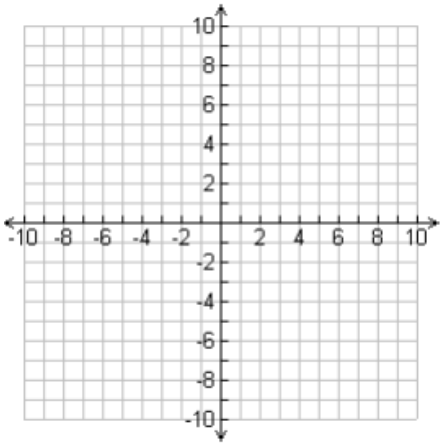
Algebra 2 Graphing Inverse Variations Name:

Ex: Compare the graphs of $y = \frac{1}{x}$ and $y = \frac{9}{x}$

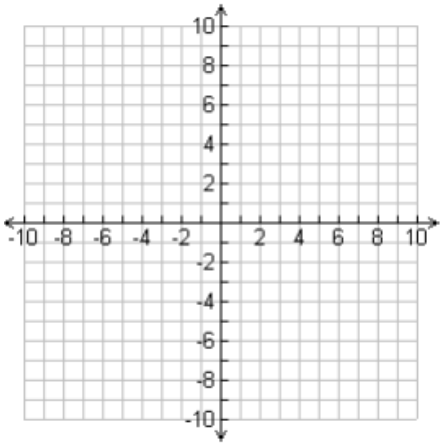
$y = \frac{1}{x}$

x	y



$y = \frac{9}{x}$

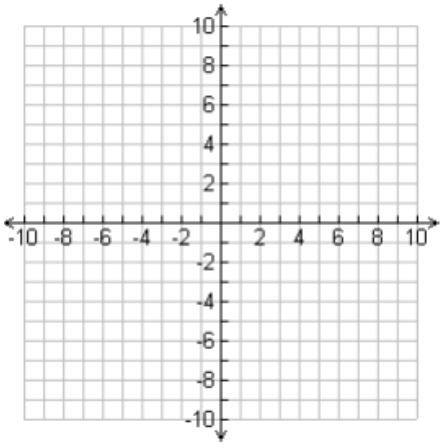
x	y



Find the points closest to the origin. How do the *x* and *y* values compare to the value in the numerator of the inverse variation?

The *x*-axis (the line $y = 0$) and the y-axis (the line $x = 0$) are asymptotes of the graph. The graph approaches the asymptotes, but never reaches it.

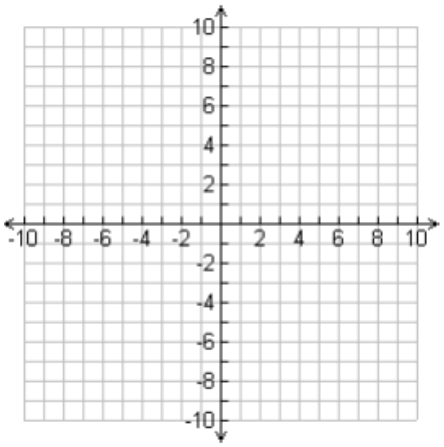
Without using a calculator, sketch a graph of the inverse variation: $y = \frac{49}{x}$
Label the asymptotes and the points closest to the origin.
Check your graph with a graphing calculator.



Ex: Compare the graphs of $y = \frac{4}{x}$ and $y = \frac{-4}{x}$

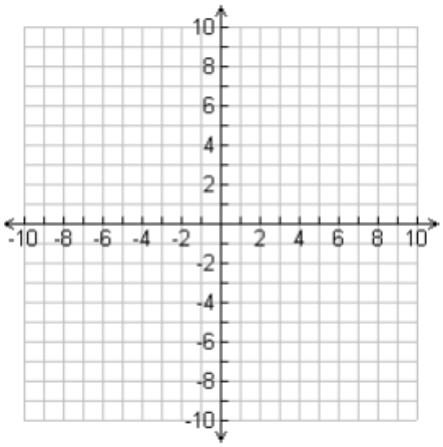
$y = \frac{4}{x}$

x	y



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

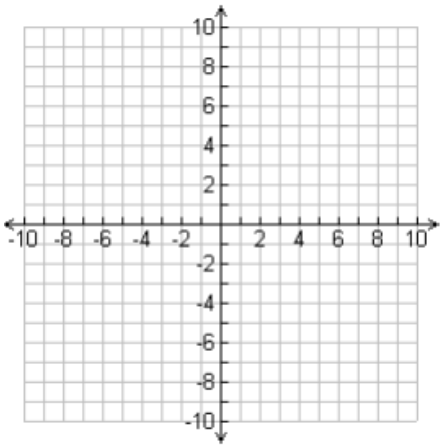
x	y



Find the points closest to the origin. How do the *x* and *y* values compare to the value in the numerator of the inverse variation?

In which quadrants are each of the graphs located?

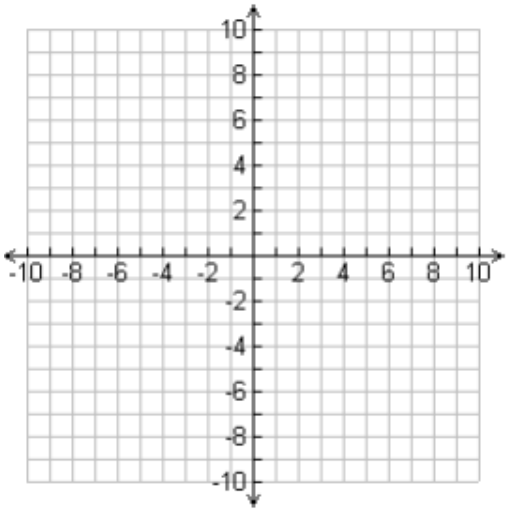
Without using a calculator, sketch a graph of the inverse variation: $y = \frac{-12}{x}$
Label the asymptotes and the points closest to the origin.
Check your graph with a graphing calculator.



Translations of Inverse Variations

The graph of $y = \frac{1}{x-b} + c$ is a translation of the graph of $y = \frac{1}{x}$ moving *b* units horizontally and *c* units vertically
The vertical asymptote is the line $x = b$
The horizontal asymptote is the line $y = c$

Ex: Sketch the graph of the inverse variation: $y = \frac{4}{x+2} + 5$



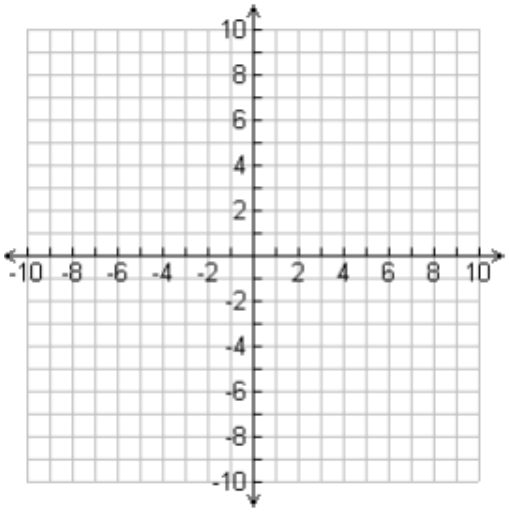
This is a translation of $y = \frac{4}{x}$
$b = -2$, so the vertical asymptote is the line $x = -2$
$c = 5$, so the horizontal asymptote is the line $y = 5$

Start your graph by drawing these asymptotes on the graph.

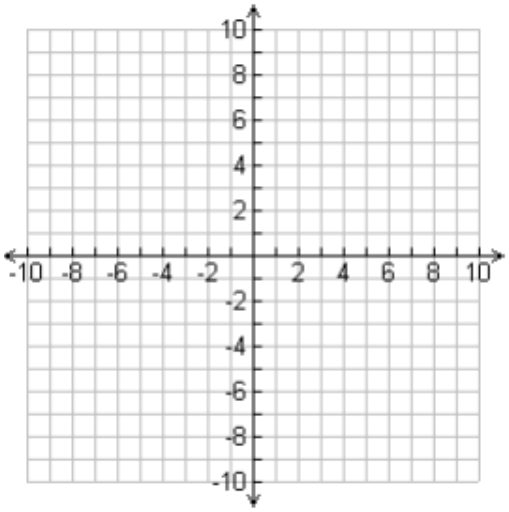
Then find the points closest to the intersection of these asymptotes by taking the square root of 4.

Label the points closest to the intersection of the asymptotes.

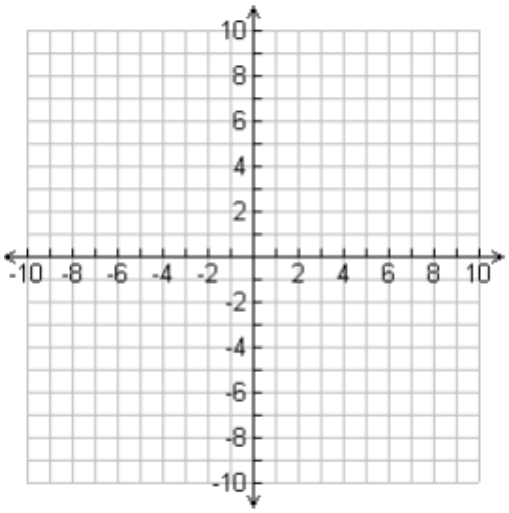
1. Sketch the graph of the inverse variation: $y = \frac{-2}{x} + 5$



2. Sketch the graph of the inverse variation: $y = \frac{1}{x-3} + 4$



3. Sketch the graph of the inverse variation: $y = \frac{-10}{x+1} - 6$



4. Sketch the graph of the inverse variation: $y = \frac{5}{x+3} - 4$