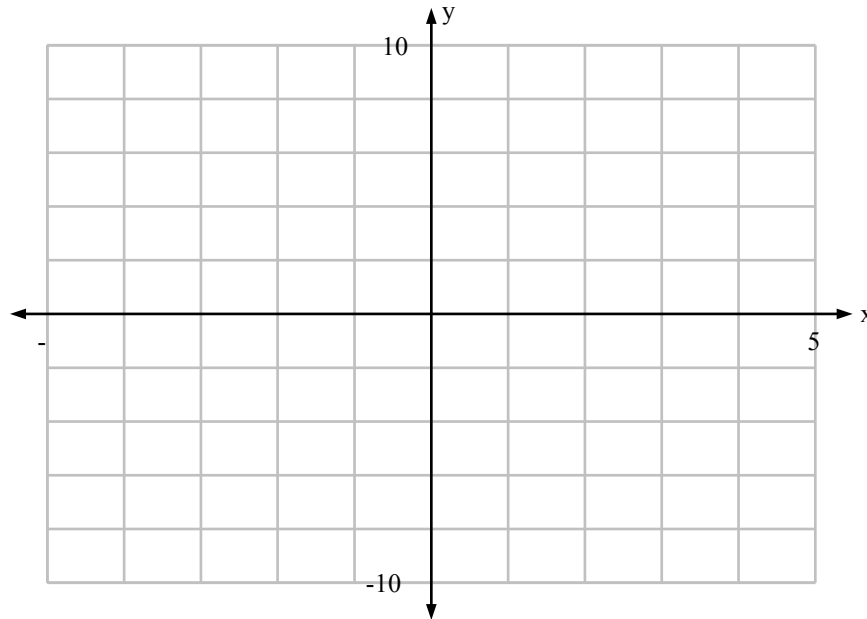


More Rational Functions

1. Let $f(x) = \frac{(x+2)(x+1)}{(x-2)(x+3)}$.

- a. Sketch the graph of the function. Label all important features. (Watch the scale carefully.)



- b. State the domain of f . How does the domain relate to the location of the vertical asymptotes?
- c. What happens to y as x gets larger and larger, that is, as $x \rightarrow \infty$?

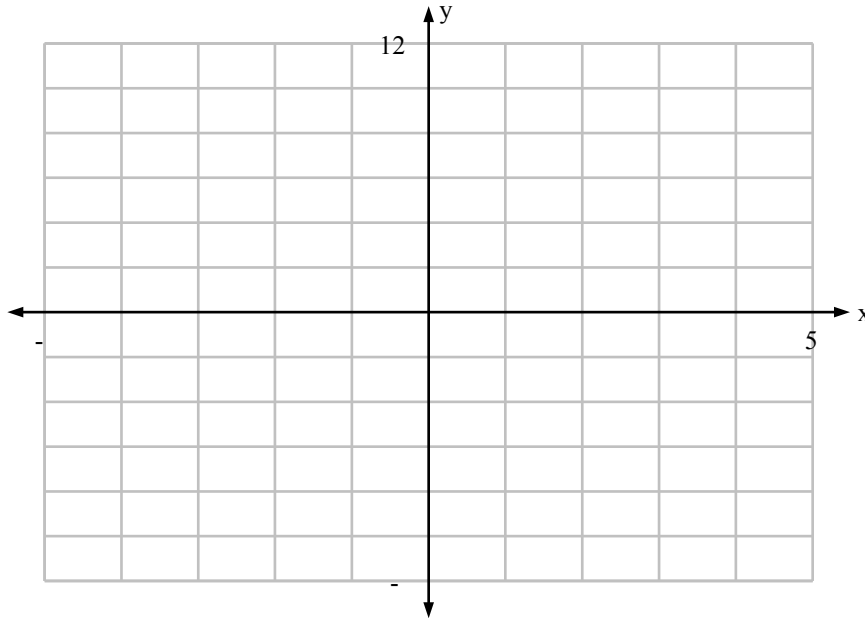
We say, "The limit of $f(x)$ as x approaches infinity is equal to 1," and write this as

$$\lim_{x \rightarrow \infty} \frac{(x+2)(x+1)}{(x-2)(x+3)} = 1,$$

Now, write the equation of the horizontal asymptote of f .

2. Let $g(x) = \frac{-3x^2}{(x-3)(x+4)}$.

- a. State the domain of g .
- b. Find $\lim_{x \rightarrow \infty} g(x)$
- c. Write the equations of all asymptotes of g .
- d. Sketch a good graph to confirm your work above, labeling all important features. Scale!



3. Write the equations of all asymptotes for each of the following functions.
Check your answers by graphing the functions.

$$m(x) = \frac{4x^2}{(x+5)(x-1)}$$

$$n(x) = \frac{8x^2}{5x(x-3)}$$

$$p(x) = \frac{-x^3}{(x-4)(x+1)(x+2)}$$

- 4. Explain how the equation may be used to determine its
 - a. vertical asymptotes.
 - b. horizontal asymptotes.