MCR 3U   Date: _____
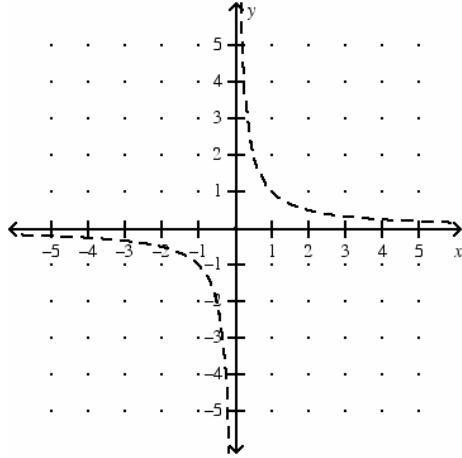
Rational Functions Graphs

In the functions unit we studied the Reciprocal Function, which is in the family of Rational Functions.
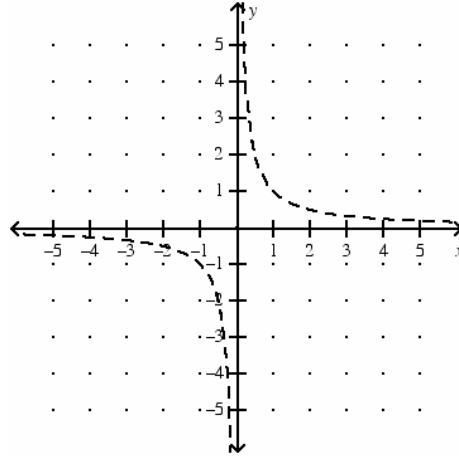We looked at $y = \dfrac{1}{x}$

Use your knowledge of functions (and transformations) to sketch the graph of each of the following.

a) $y = \dfrac{1}{x + 3}$

b) $y = \dfrac{1}{x - 1}$

Remember: The zeros of the denominator result in vertical asymptotes.

What happens when a factor of the denominator is also a factor of the numerator?

If a factor in the denominator divides out with the same factor in the numerator, the restriction takes the shape of a hole in the graph.

If a factor in the denominator does not divide out, the restriction is a vertical asymptote.

Ex: Simplify the equation of each of the functions, decide whether you have a hole and/or a vertical asymptote, and sketch the graph of the function.
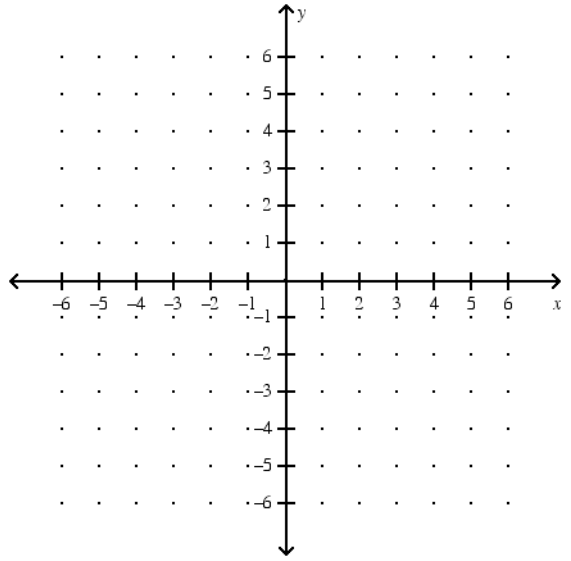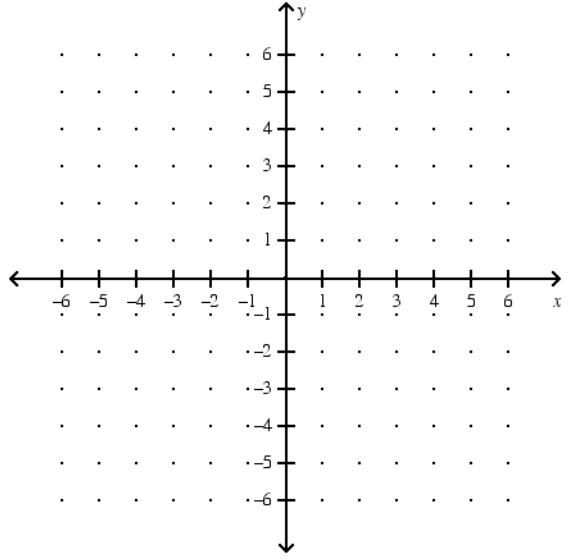
a) $y = \dfrac{3x - 1}{3x^2 + 5x - 2}$

Sketch:
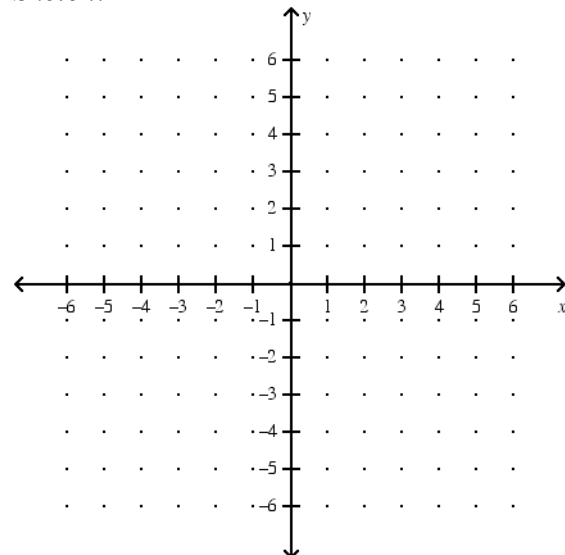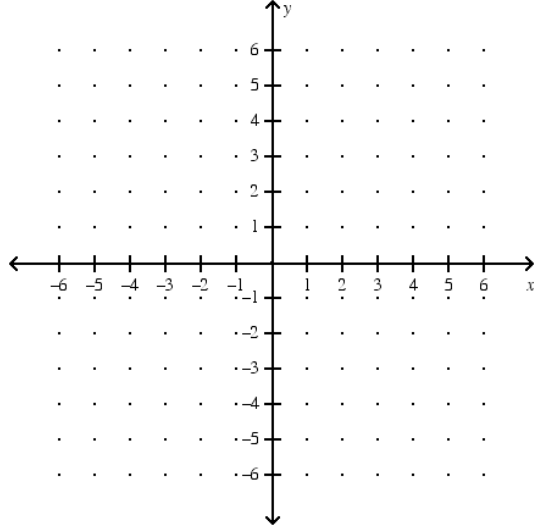
b) $y = \dfrac{x^2 - 1}{x + 1}$

Sketch:

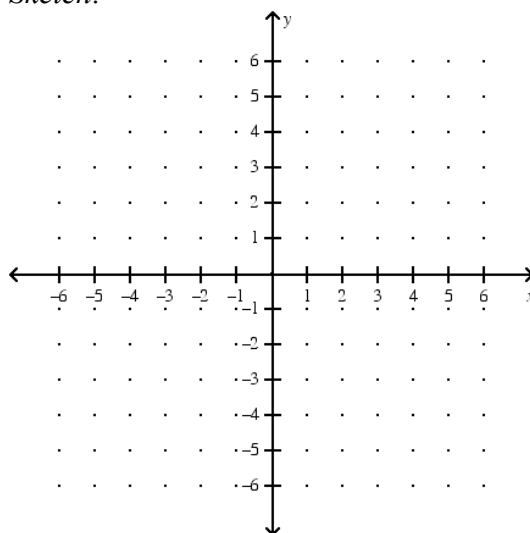c) $y = \dfrac{x + 1}{x^2 - 1}$

Sketch:

d) $y = \dfrac{2x^2 - 7x + 6}{x - 2}$

Sketch:

e) $y = \dfrac{x^2 - 9}{4x + 12}$

Sketch:

f) $y = \dfrac{4x - 10}{4x^2 - 25}$

Sketch: