Understanding Rational Functions   Name: _____
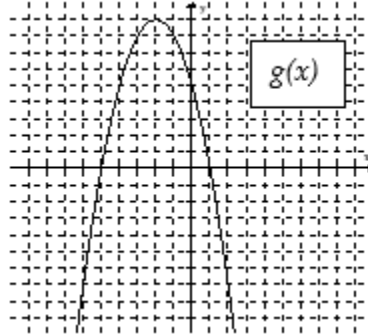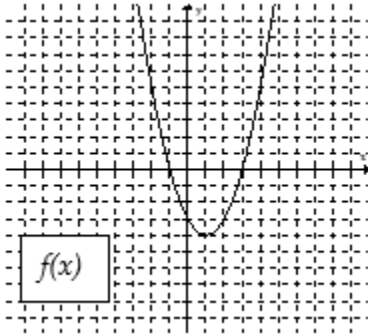
1. Use the graphs of f(x) and g(x) given below to answer the following.

a) If we let $h(x) = \frac{f(x)}{g(x)}$,

Is $h(x)$ a rational function? Why?

b) What is (are) the vertical asymptotes of h(x)?   c) What is (are) the zeros of h(x)?

2) Write the transformed equation for each:

a) Shift the graph of $y = \frac{1}{2x-3}$ two units to the right.

b) Shift the graph of $y = \frac{3x-1}{2x^2+5}$ four units down.

c) Reflect the graph of $y = \frac{x+1}{x-3}$ across the y-axis.

d) Shift the graph of $y = \frac{x}{2x+4}$ two units to the left and five up.

3) Write an equation for each of the following

a) A rational function with asymptotes y = 0, x = 2, x = –3

b) A rational function with asymptotes y = 2, x = –1

c) A rational function with asymptotes y = 1, x = –3, and a hole at x = 2

d) A rational function with asymptotes y = 3, x =2, and x = –2

4) Suppose y = f(x) is a rational function with a horizontal asymptote of y = 3 and a vertical asymptote of x = 5.

a) What is the domain of f(x)?

b) What are the asymptotes of the transformed function y = f(x – 2)?

c) What are the asymptotes of the transformed function y = f(x) + 5?

d) What are the asymptotes of the transformed function y = f(x + 3) – 4

5) If y = f(x) is a rational function with a horizontal asymptote of y = 0 and a vertical asymptotes at x = 5 and x = −2.

a) What is the domain of f(x)?

b) What are the asymptotes of the transformed function y = f(x + 1)?

c) What are the asymptotes of the transformed function y = f(x) − 4?

d) What are the asymptotes of the transformed function y = f(x − 3) + 7

5) Find an equation for each of the rational functions represented below (Leave in factored form):

(3,7)

(-4,0)   (2,0)

(-1,-9)   (0,-8)

(3/2,0)

(4,6)

(-2,0)

(0,-6)

(4,0)