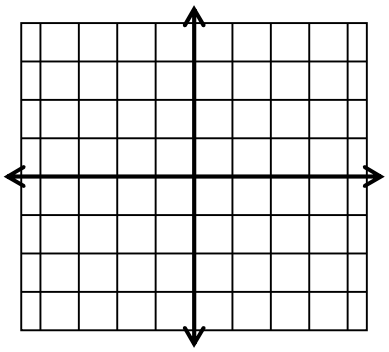
Acc. Geom/Algebra II Name_____

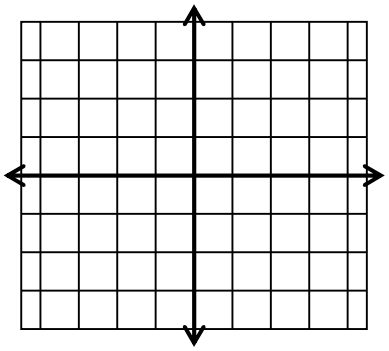
Graphing Rational Functions Worksheet #1 Period _____Date _____

1. Consider the function $f(x) = x^2$.



   A) **Sketch** this function to the right.
   B) What is its **domain**? _____
   C) What is its **range**? _____
   D) What are coordinates of its **vertex**? _____

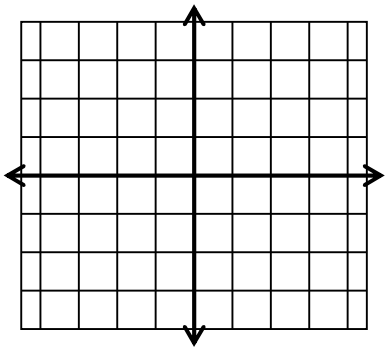
2. Consider the function $g(x) = \frac{1}{x}$.



   A) **Sketch** this function to the right.
   B) What is its **domain**? _____
   C) What is its **range**? _____
   D) An **asymptote** is a line that a graph gets very close to. What are equations of the asymptotes of this graph?
   _____

3. Consider the equation of $f(x)$, if it is translated up 4 units and to the right 3 units.
   A) Write the **equation** of this new function. _____
   B) How can we tell from the equation that is has been moved? _____
   C) What is the new **domain**? _____
   D) What is the new **range**? _____
   E) What are coordinates of the new **vertex**?_____

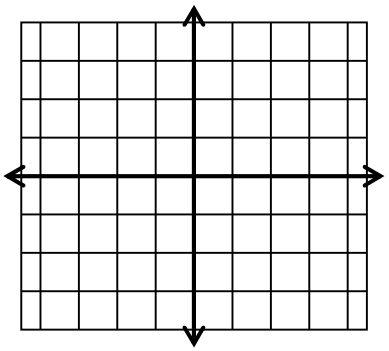
4. Consider the equation $h(x) = 4 + \frac{1}{x - 3}$.



   A) **Graph** this function in the space to the right.
   B) How is it like $g(x)$? _____
   C) How is it different from $g(x)$? _____
   D) What is the new **domain**? _____
   E) What is the new **range**? _____
   F) What are equations of the **asymptotes**?
   _____

Continued on the back

5. Consider the function $j(x) = \dfrac{3x - 4}{x + 2}$.



A) **Graph** this function in the space to the right.

B) How is it like $g(x)$? _____

C) How is it different from $g(x)$? _____

D) **Divide** this function and write the quotient.

E) Use the above quotient to describe the **transformations** on $g(x)$.

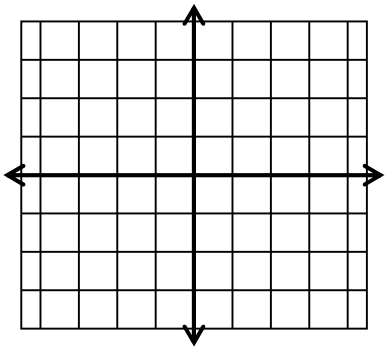
F) What is the **domain**? _____

G) What is the **range**? _____

H) What are equations of the **asymptotes**?

_____

6. Consider the function $F(x) = \dfrac{x^2 - x - 6}{x - 3}$



A) **Graph** this function in the space to the right.

B) Why doesn't it appear to have asymptotes?

C) **Factor** the numerator and **simplify** this function.

D) What is the **domain**? _____

E) What is the **range**? _____

F(3) is **undefined** (actually, it is called **indeterminate form**) when $x = 3$. The point (3, 5) is described as a "removable discontinuity" in calculus, but we shall describe it as a hole in our graph. How could we algebraically get that **y**-value from our equation?

7. For each of the following: a) find the **domain** of the function, b) **divide** to write the function in transformational form, c) find equations of all the **asymptotes**, d) describe the **transformations** on $y = 1/x$ that have been done to this function and, e) **sketch** the graph.

A) $f(x) = \dfrac{5}{x - 2}$ B) $f(x) = \dfrac{-2x + 5}{x + 1}$ C) $f(x) = \dfrac{3x - 2}{x}$