Name:_____ Hour: _____ Date: _____

NOTES: Section 8.2 – Graph Simple Rational Functions

Goals: #1 - I can graph rational functions of the form $y = \frac{a}{x-h} + k$

#2 - I can graph rational functions of the form $y = \frac{ax+b}{cx+d}$

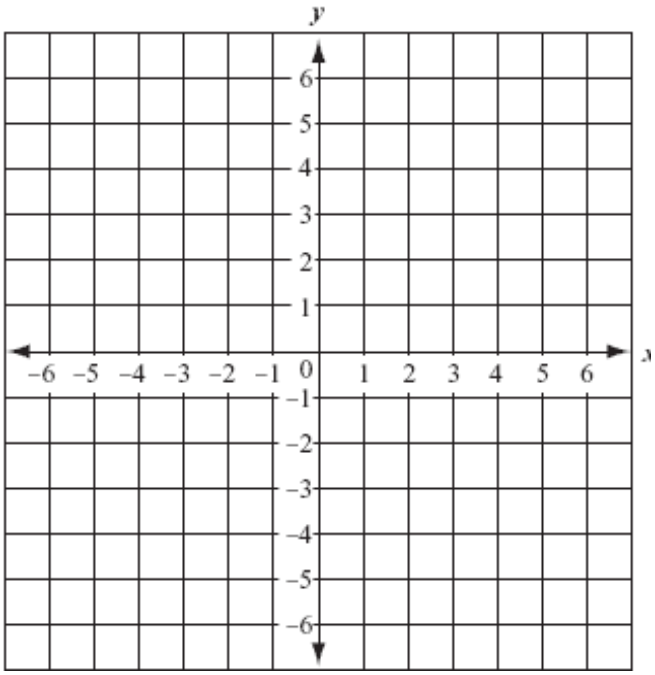
Homework: Lesson 8.2 Worksheet

Exploration #1: Work with a partner and answer the following questions.

1. Complete the table of vaules to graph the following function.

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

x	y
-3	
-2	
-1	
0	
1	
2	
3	

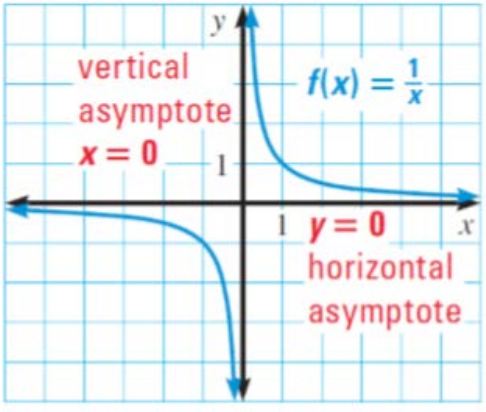


Notes:

A _____ function is a function in the form: $f(x) = \frac{a}{x}$

The shape of this graph is called a _____

which consists of two _____ branches.

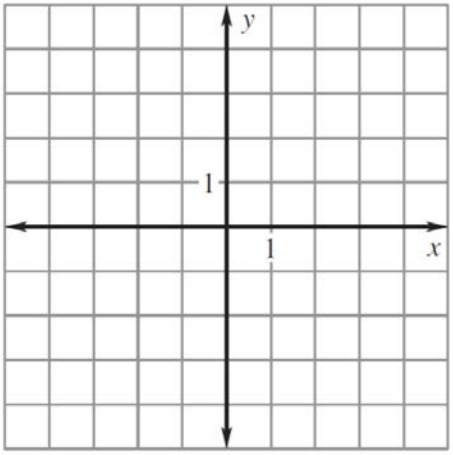


Domain:_____ Range: _____

Name:_____ Hour: _____ Date: _____

Example #1: Graph the function. Then state the domain, range, and asymptotes.

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

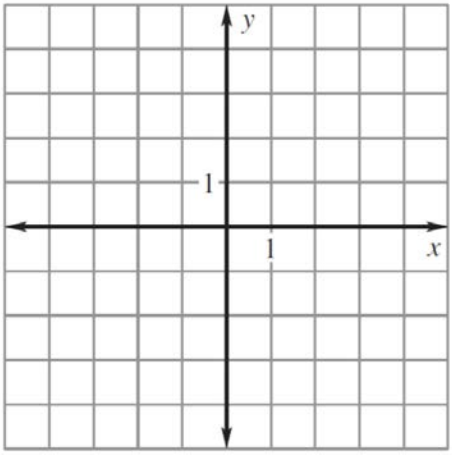


asymptotes: _____

domain: _____

range: _____

2. $y = \frac{3}{x}$



asymptotes: _____

domain: _____

range: _____

Exploration #2: Work with a partner and answer the following questions.

1. Suppose you had the function $y = \frac{1}{x}$

   a. Describe the transformation: $y = \frac{1}{x} + 1$

   b. How would this shift our horizontal asymptote?

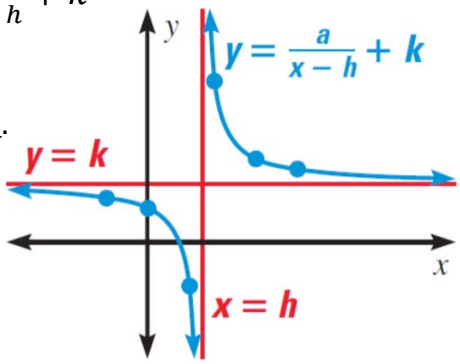
   c. Describe the transformation: $y = \frac{1}{x+1}$

   d. How would this shift our vertical asymptote?

Name:_____ Hour: _____ Date: _____

Notes:

To graph a _____ function of the form: $y = \frac{a}{x-h} + k$



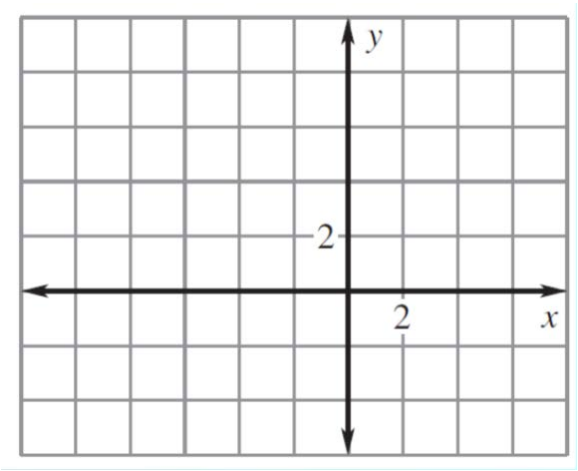
Draw the asymptotes: _____ and _____.

Plot points to the _____ and _____ of the vertical asymptote.

Draw the two _____ of the _____.

Example #2: Graph the function. Then state the domain, range, and asymptotes.

1. $y = \frac{-6}{x+3} + 2$

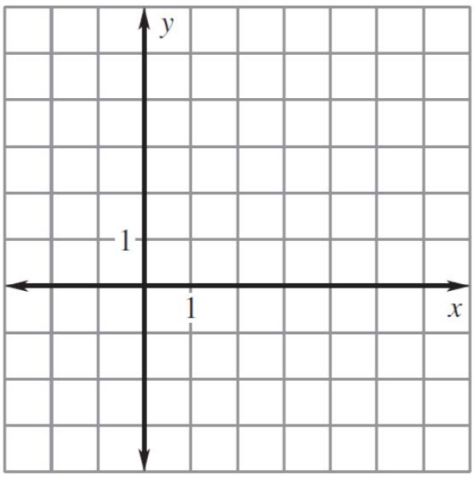


asymptotes: _____

domain: _____

range: _____

2. $y = \frac{3}{x-2} + 1$



asymptotes: _____

domain: _____

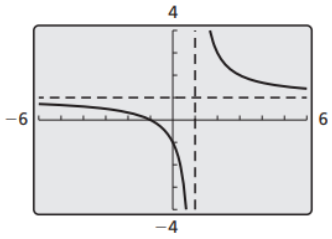
range: _____

Name:_____ Hour: _____ Date: _____

Exploration #3: Work with a partner and answer the following questions.

1. The equation of each hyperbola is shown. Find the vertical and horizontal asymptotes.

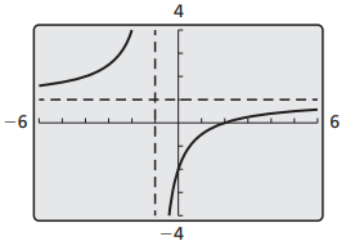
a. $y = \frac{x+1}{x-1}$



VA: _____

HA: _____

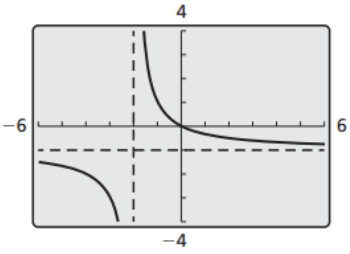
b. $y = \frac{x-2}{x+1}$



VA: _____

HA: _____

c. $y = \frac{-x}{x+2}$



VA: _____

HA: _____

Notes:

To graph a _____ function of the form: $y = \frac{ax+b}{cx+d}$

Draw the asymptotes: _____ and _____.

Plot points to the _____ and _____ of the vertical asymptote.

Draw the two _____ of the _____.

Example #3: Find the vertical and horizontal asymptote of the grpah of the function.

1. $y = \frac{4}{x} + 3$

VA: _____

HA: _____

2. $y = \frac{2x+1}{4x-2}$

VA: _____

HA: _____

3. $y = \frac{-3x+2}{-x-1}$

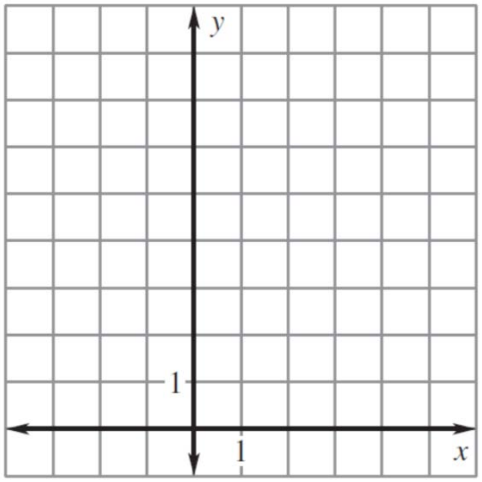
VA: _____

HA: _____

Name:_____ Hour: _____ Date: _____

Example #4: Graph the function. Then state the domain, range, and asymptotes.

1. $y = \frac{4x - 2}{x - 1}$

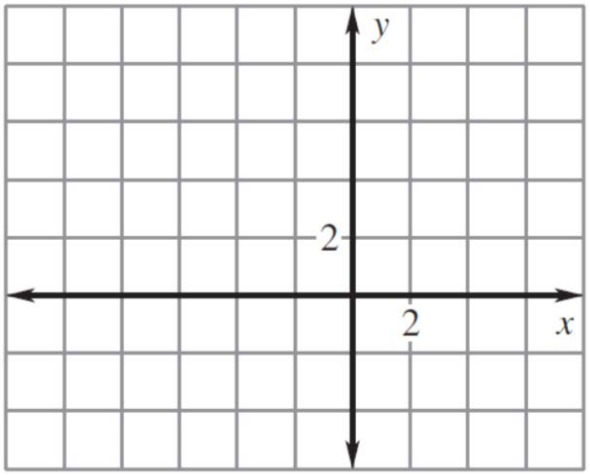


asymptotes: _____

domain: _____

range: _____

2. $y = \frac{-2x + 1}{-x - 2}$



asymptotes: _____

domain: _____

range: _____