

6.3

Date: _____

Objective: _____

Writing Equations of Rational Functions

If you are given the graph, you should be able to write a rational equation to match.

Find the asymptotes and intercepts. Then write the vertical asymptotes and x -intercept(s) as factors. Next be sure your rules for the horizontal asymptotes work. Lastly, make sure your y -intercept is correct.

EXAMPLES:

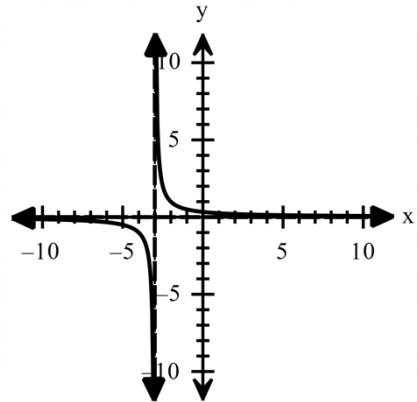
1. Vertical Asymptote: _____

Domain: _____

Horizontal Asymptote: _____

x -intercept: _____

Equation: _____



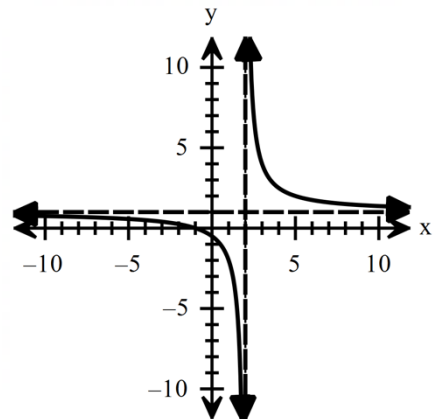
2. Vertical Asymptote: _____

Domain: _____

Horizontal Asymptote: _____

x -intercept: _____

Equation: _____



Now try this one using the rule about multiplicity.

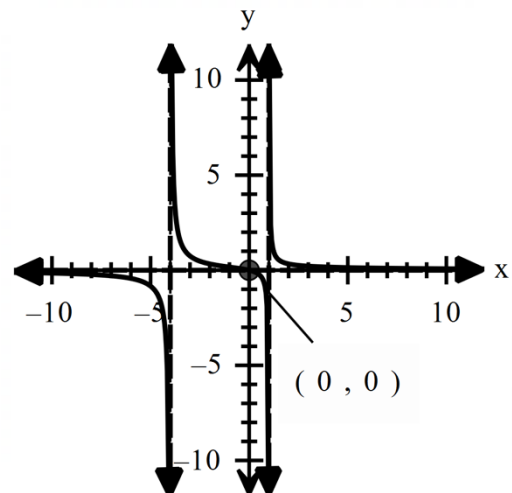
3. Vertical Asymptote: _____

Domain: _____

Horizontal Asymptote: _____

x -intercept: _____

Equation: _____



Graphing Rational Functions

Using the asymptotes and intercepts, you should be able to graph the equation.

Use a sign array to help determine where each section of the rational function is graphed. Plug in different x -values into the equation (depending on asymptotes)....

- If it says positive, that means the y -values are positive in that section. This means in that section the graph is above the x -axis.
- If it says negative, that means the y -values are negative in that section. This means in that section the graph is below the x -axis.

Example: Use the following information to graph the rational equations without technology and determine the domain.

4. $f(x) = \frac{1}{x+8}$

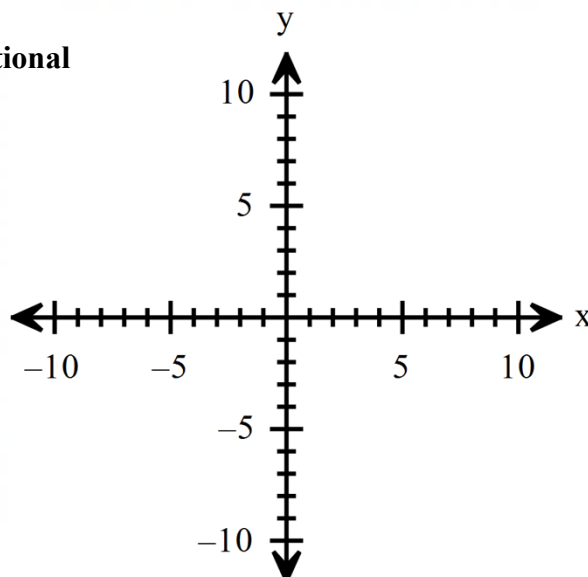
vertical asymptote: $x = -8$

horizontal asymptote: $y = 0$

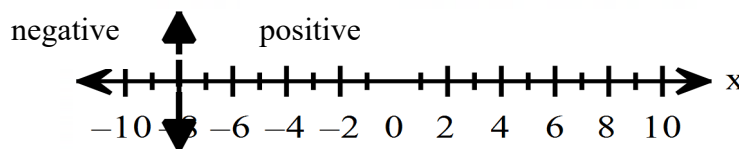
x -intercept: NONE

y -intercept: $(0, \frac{1}{8})$

Domain: _____



Use the given sign array to help graph the rational function. Describe how to find each piece of the given sign array.



EXAMPLES: Find the following information. Then graph the equation.

5. $f(x) = \frac{1}{x+5}$

Vertical Asymptote: _____

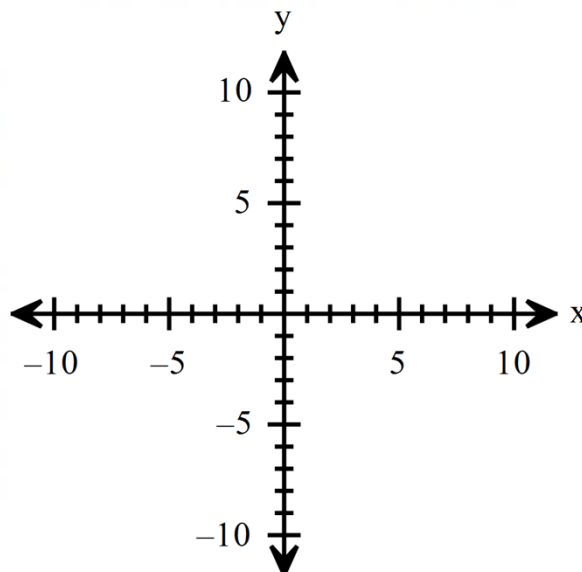
Domain: _____

Horizontal Asymptote: _____

x -intercept: _____

y -intercept: _____

Sign array:



6. $f(x) = \frac{x+4}{x-1}$

Vertical Asymptote: _____

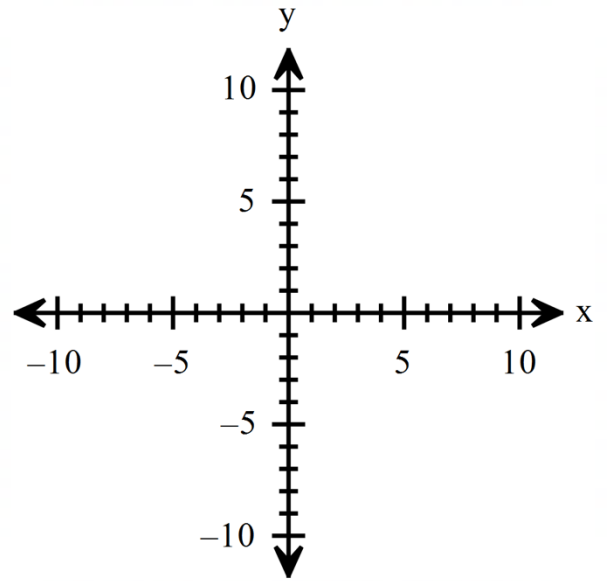
Domain: _____

Horizontal Asymptote: _____

x-intercept: _____

y-intercept: _____

Sign array:



7. $f(x) = \frac{x-1}{x^2-x-6}$

Vertical Asymptote: _____

Domain: _____

Horizontal Asymptote: _____

x-intercept: _____

y-intercept: _____

Sign array:

