

# 9.3 Part II

## Rational Functions and Graphs

**WARM UP - Simplify and state the restrictions.**

1) 
$$\frac{x^2 - 5x - 24}{x^2 - 9}$$

**State the Vertical Asymptotes and Holes and Horizontal Asymptotes.**

2) 
$$y = \frac{x + 3}{x - 4}$$

3) 
$$y = \frac{x + 5}{x^2 + 2x - 15}$$

**4) Given  $y = 1/x$ , write the equation that will shift the graph 3 units to the left and 5 units up and reflect it over the x-axis.**

Pull for Teacher's Notes

## Graphs Example 1

Graph the function.

$$y = \frac{|x+3|}{|x-3|}$$

VA:  $x = 3$

Holes: none

HA:  $y = 1$

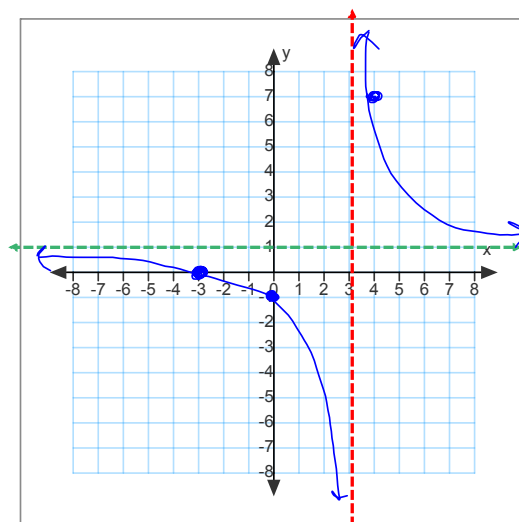
Find Intercepts.

$(-3, 0)$   $(0, -1)$

Test points to graph.

→ Set top = 0

$$\frac{4+3}{4-3} = 7$$



Pull for Solution



## Graphs Example 2

Graph the function.

$$y = \frac{1}{x^2 - 4} \quad \frac{1}{(x+2)(x-2)}$$

VA:  $x = \pm 2$

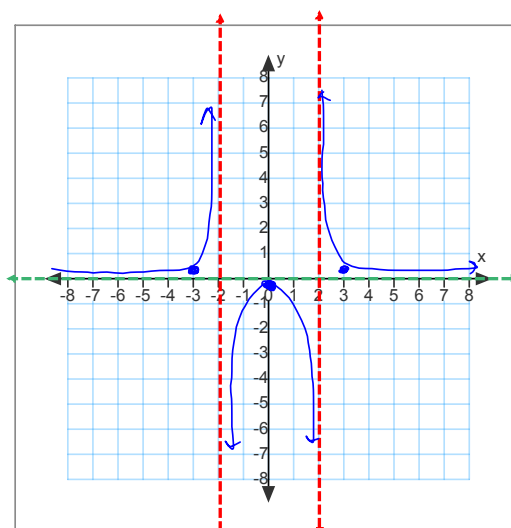
Holes: none

HA:  $y = 0$

Find Intercepts.

~~(        , 0)~~ ~~(0,         )~~

Test points to graph.



$$\frac{1}{(-3)^2 - 4} = \frac{1}{5}$$

Use the dashed **red** lines to graph asymptotes, if needed.

Pull for Teacher's Notes

## Graph Example 3

$$y = \frac{4x^2 - 100}{2x^2 + x - 15} = \frac{4(x+5)(x-5)}{(2x-5)(x+3)}$$

VA:  $x = -3, \frac{5}{2}$

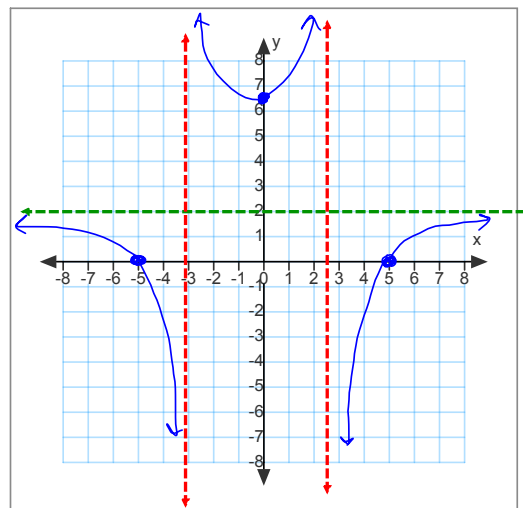
Holes: none

HA:  $y = 2$

Find Intercepts.

$(-5, 0)$   $(0, \frac{2}{3})$

Test points to graph.



Pull for Hint

Pull for Solution

Graph **asymptotes** using the dashed **red** lines.



Pull for Teacher's Notes

## Graph Example 4

$$y = \frac{4x^2 - 100}{x^2 - 2x - 15}$$

$$\frac{4(x+5)(x-5)}{4(x+5)(x-5)}$$

$$\text{VA: } x = -3$$

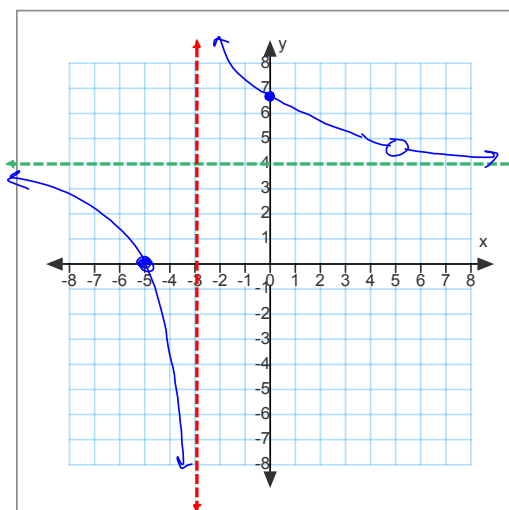
$$\text{Holes: } 5$$

$$\text{HA: } y = 4$$

Find Intercepts.

$$(-5, 0) \quad (0, 6\frac{2}{3})$$

Test points to graph.



Pull for Hint

Pull for Solution

Graph **asymptotes** using the dashed **red** lines.



HW 9.3 Part II

p. 506 #26-29 (skip 28),  
32, 35-40 (skip 36)