

# Algebra 1

Chapter 11

Section 11-7

## Review: Finding Excluded Values

$$\frac{2}{x-3}$$

$$\begin{aligned} x-3 &\neq 0 \\ +3 \quad +3 \\ x &\neq 3 \end{aligned}$$

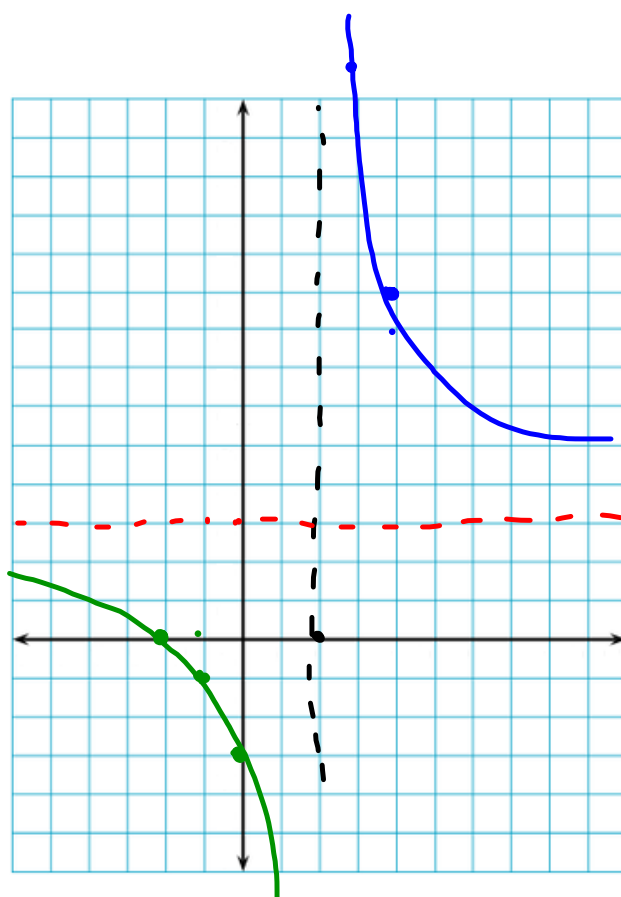
$$\frac{11}{x(x+5)}$$

$$\begin{aligned} x(x+5) &\neq 0 \\ \swarrow \quad \downarrow \\ \boxed{x \neq 0} \quad &x+5 \neq 0 \\ &\quad \quad \quad \begin{aligned} &\quad \quad \quad -5 \quad -5 \\ &\quad \quad \quad \boxed{x \neq -5} \end{aligned} \end{aligned}$$

Graph the following function using the table method:

$$y = \frac{12}{x-2} + \underline{\underline{3}}$$

X	Y
-2	0
-1	-1
0	-3
1	-9
<del>2</del>	
3	15
4	9



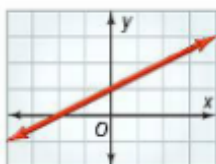
**Vocab:** asymptote - an line on a graph, the curve gets closer to the asymptote as  $x$  or  $y$  increase in absolute value.

The graph of a rational function of the form  $y = \frac{a}{x - b} + c$  has a vertical asymptote at  $x = b$  and a horizontal asymptote at  $y = c$ .

# Graphs from Algebra 1

## Linear function

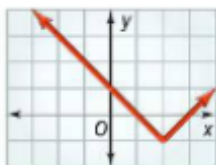
$$y = mx + b$$



parent function:  $f(x) = x$   
 slope =  $m$   
 y-intercept =  $b$   
 The greatest exponent is 1.

## Absolute value function

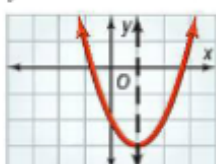
$$y = |x - a| + b$$



parent function:  $f(x) = |x|$   
 Shift  $y = |x|$  horizontally  $a$  units.  
 Shift  $y = |x|$  vertically  $b$  units.  
 vertex at  $(a, b)$   
 The greatest exponent is 1.

## Quadratic function

$$y = ax^2 + bx + c$$



parent function:  $f(x) = x^2$   
 parabola with axis of symmetry at  $x = -\frac{b}{2a}$   
 The greatest exponent is 2.

## Exponential function

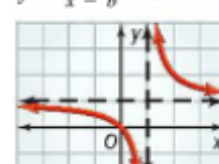
$$y = ab^x$$



growth where  $b > 1$   
 decay where  $0 < b < 1$   
 The variable is the exponent.

## Rational function

$$y = \frac{a}{x - b} + c$$



vertical asymptote at  $x = b$   
 horizontal asymptote at  $y = c$   
 The variable is in the denominator.

Identify the asymptotes of the graph defined by the following equation:

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

$$x=2$$

$$y=3$$

$$\text{If } x=1$$

$$\frac{1}{1-2} + 3$$

$$-\frac{1}{1} + 3$$

$$-1 + 3$$

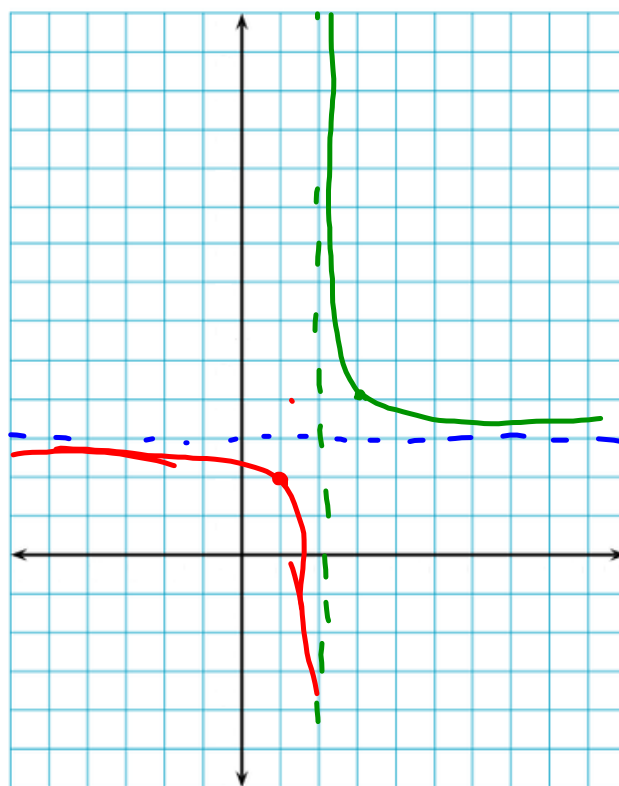
$$2$$

$$\text{If } x=3$$

$$\frac{1}{3-2} + 3$$

$$\frac{1}{1} + 3$$

$$4$$



Identify the asymptotes of the graph defined by the following equation:

$$y = \frac{1}{(x + 3)(x + 7)} - 5$$

$$x = -3$$

$$x = -7$$

$$y = -5$$

