

Name: _____

Date: _____

Hour: _____

Precalculus Unit 7 Extra Practice

I CAN analyze the twelve basic functions.

Identity Function $y = x$	Squaring Function $y = x^2$	Cubing Function $y = x^3$	Reciprocal Function $y = \frac{1}{x}$
Square Root Function $y = \sqrt{x}$	Absolute Value Function $y = x $	Exponential Function $y = e^x$	Natural Logarithm Function $y = \ln x$
Sine Function $y = \sin x$	Cosine Function $y = \cos x$	Greatest Integer Function $y = \text{int}[x]$	Logistic Function $y = \frac{1}{1 + e^{-x}}$

Identify which of the twelve basic functions, listed above, fit the description given.

1. The three functions that are even.

squaring / ~~expo~~ absolute value / cosine

2. The two functions with infinitely many zeroes.

sine / cosine

3. The three functions with end behavior
- $\lim_{x \rightarrow -\infty} f(x) = -\infty$
- .

identity / cubing / natural log

4. The three functions that are bounded.

sin / cos / logistic

5. The four functions that are odd.

cubing / identity / reciprocal / sine

6. The three functions with no zeros.

reciprocal / exponential / logistic

7. The two functions with end behavior
- $\lim_{x \rightarrow -\infty} f(x) = \infty$
- .

squaring / absolute value

8. The three functions that are bounded above.

sine / cosine / logistic

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I CAN analyze the graph of a rational function.

1. Domain: $(-\infty, -1) \cup (-1, \infty)$

Range: $(-\infty, 0) \cup (0, \infty)$

zeroes: _____

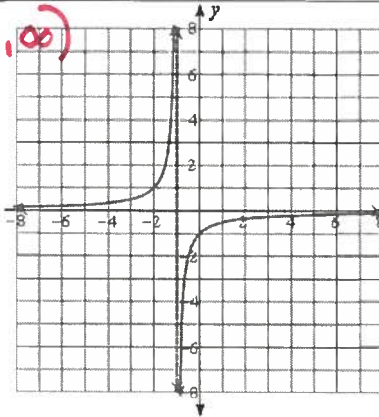
y-intercepts: _____

Continuous: no

Bounded: _____

Vertical Asymptotes: $x = -1$

Horizontal Asymptotes: $y = 0$



2.

Domain: _____

Range: _____

zeroes: _____

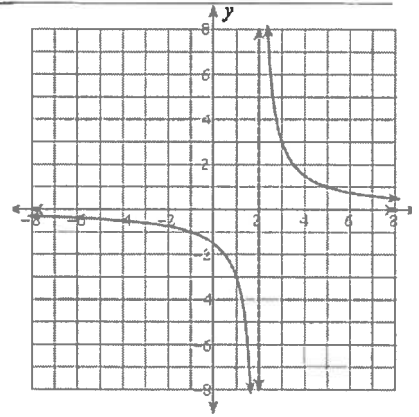
y-intercepts: _____

Continuous: _____

Bounded: _____

Vertical Asymptotes: _____

Horizontal Asymptotes: _____



Similar to # 1

3. Domain: $(-\infty, -1) \cup (-1, 1) \cup (1, \infty)$

Range: $(-\infty, 1) \cup (1, \infty)$

zeroes: $(3, 0)$ $(-3, 0)$

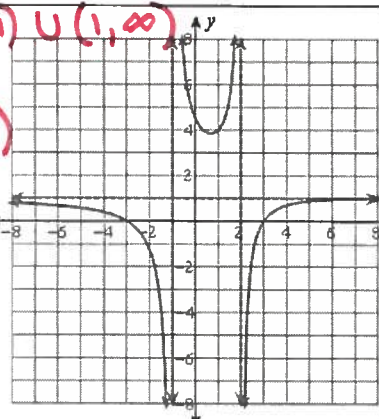
y-intercepts: $(0, 4.5)$

Continuous: no

Bounded: neither

Vertical Asymptotes: $x = \pm 1$

Horizontal Asymptotes: $y = 1$



4. Domain: $(-\infty, -3) \cup (-3, 1) \cup (1, \infty)$

Domain: _____

Range: \mathbb{R} or $(-\infty, \infty)$

zeroes: $(-1, 0)$, $(4, 0)$

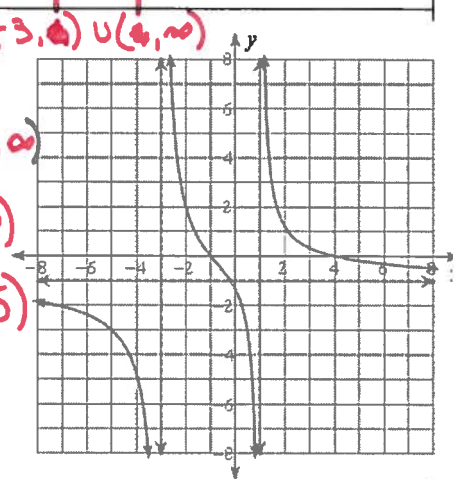
y-intercepts: $(0, -1.5)$

Continuous: no

Bounded: _____

Vertical Asymptotes: $x = -3$, $x = 1$

Horizontal Asymptotes: $y = -1$



technically range is $(-\infty, 1) \cup [3.9, \infty)$

↑
minimum of U shape

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I CAN analyze rational functions for critical information and graph.

1. $f(x) = \frac{1}{x+3}$

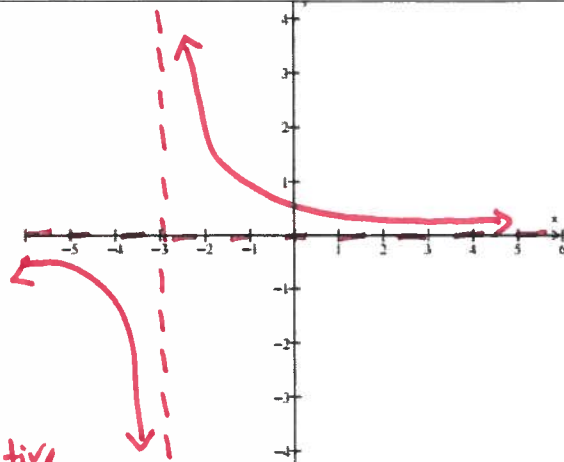
Vertical Asymptotes: $x = -3$ Horizontal Asymptotes: $y = 0$

x-intercept: —

y-intercept: $(0, \frac{1}{3})$

Use limits to describe the corresponding behavior.

$$\lim_{x \rightarrow -\infty} f(x) = 0 \quad \text{*same w/ positive } \infty$$

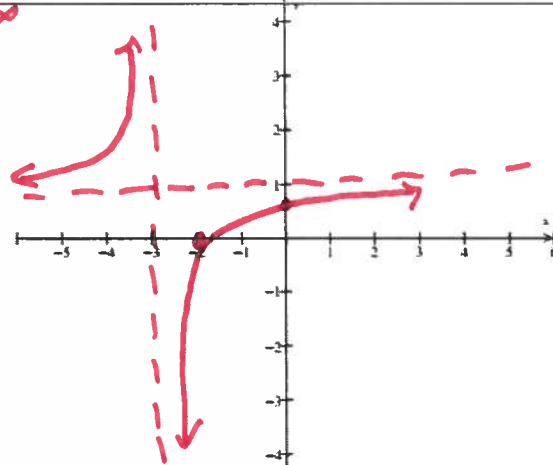


2. $f(x) = \frac{x+2}{x+3}$

Vertical Asymptotes: $x = -3$ Horizontal Asymptotes: $y = 1$ x-intercept: $(-2, 0)$ y-intercept: $(0, \frac{2}{3})$

Use limits to describe the corresponding behavior.

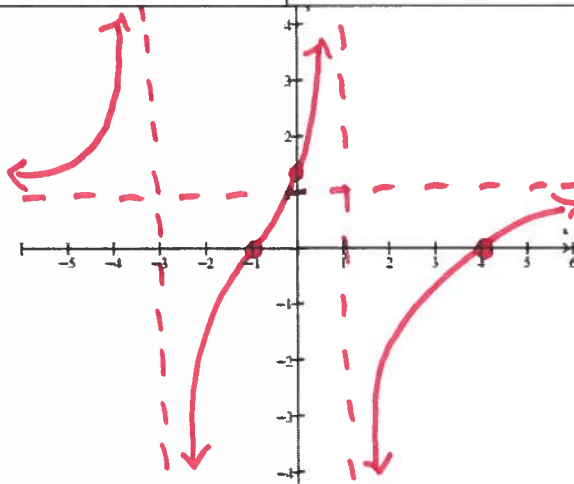
$$\lim_{x \rightarrow -\infty} f(x) = 1$$



3. $f(x) = \frac{x^2 - 3x - 4}{x^2 + 2x - 3} = \frac{(x-4)(x+1)}{(x+3)(x-1)}$

Vertical Asymptotes: $x = -3, x = 1$ Horizontal Asymptotes: $y = 1$ x-intercept: $(4, 0), (-1, 0)$ y-intercept: $(0, \frac{4}{3})$

Use limits to describe the corresponding behavior.



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Precalculus Unit 7 Extra Practice

4.

Function:

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

Vertical Asymptotes:

$$x = -2, x = 3$$

Horizontal Asymptotes:

$$y = 0$$

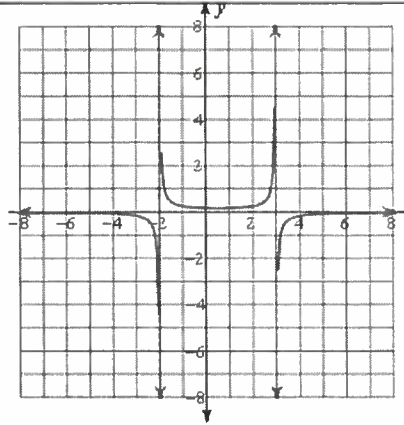
x-intercept:

—

y-intercept:

$$(0, .1)$$

↑ estimate



5.

Function:

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

Vertical Asymptotes:

$$x = -3$$

Horizontal Asymptotes:

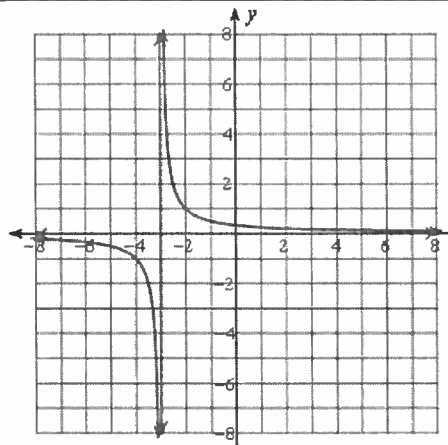
$$y = 0$$

x-intercept:

—

y-intercept:

$$(0, \frac{1}{3})$$



6.

Function:

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

Vertical Asymptotes:

$$x = -2, x = 3$$

Horizontal Asymptotes:

$$y = 0$$

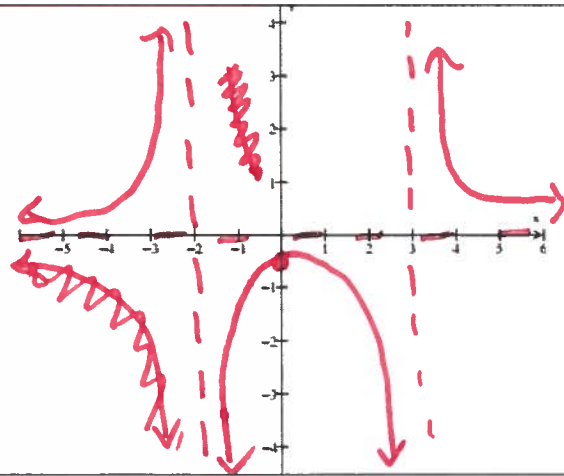
x-intercept:

NONE

y-intercept:

$$(0, -\frac{1}{3})$$

← need 2 in numerator to get this y-int



Use y-int to figure out where graph is and remember there are no x-int