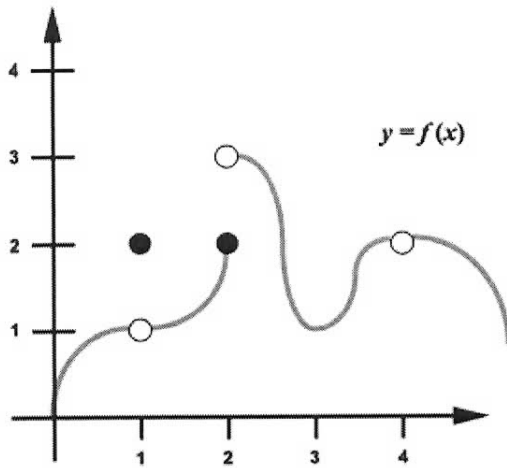


Day 8

Friday, September 22, 2017
8:09 AM



Unit 2 Day 8
Guided No...



Warm-up: Evaluate each limit for $f(x)$.

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

2. $\lim_{x \rightarrow 2^-} f(x) = 2$

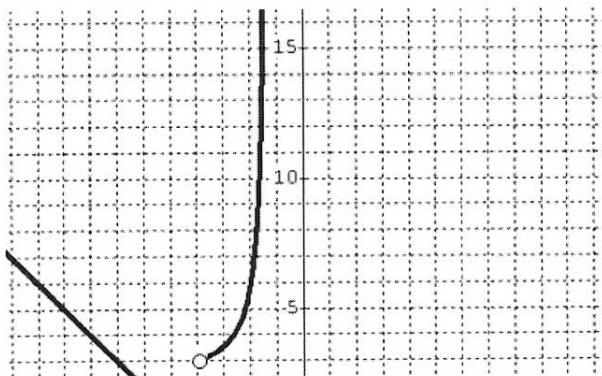
3. $\lim_{x \rightarrow 2^+} f(x) = 3$

4. $\lim_{x \rightarrow 2} f(x) = \text{DNE}$

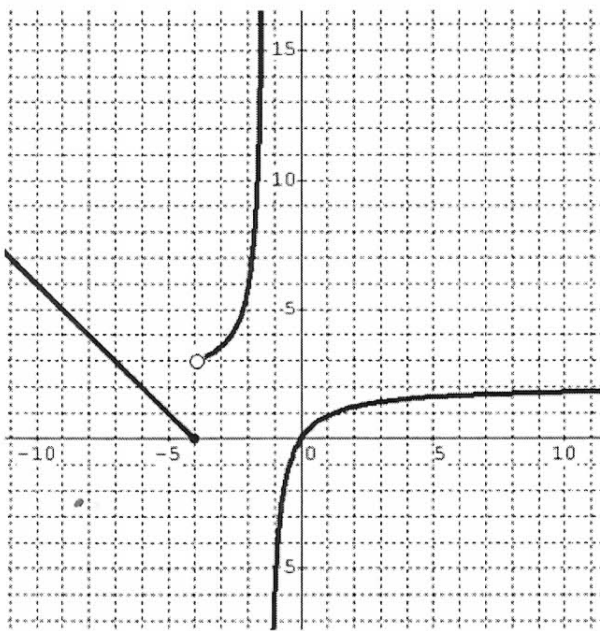
5. $\lim_{x \rightarrow 4} f(x) = 2$

Homework Questions?

Can you describe all parts of the graph using limits?



(over)



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

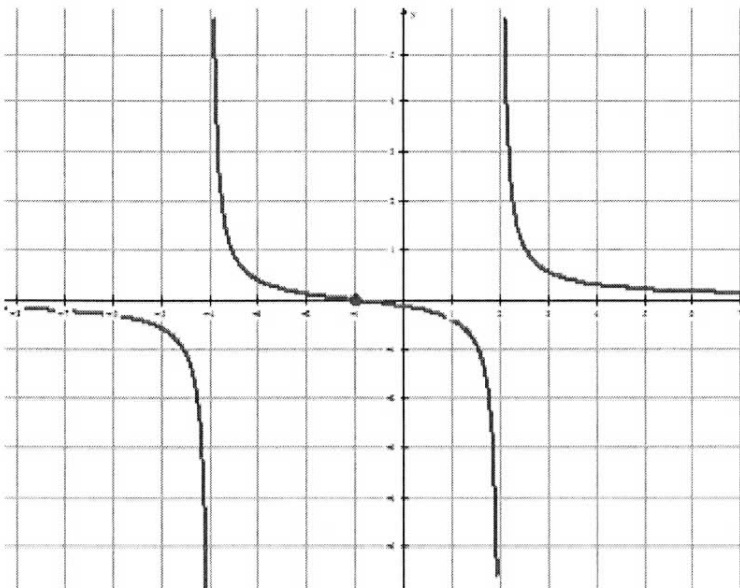
$$\lim_{x \rightarrow -4^-} f(x) = 0$$

$$\lim_{x \rightarrow -4^+} f(x) = 3$$

$$\lim_{x \rightarrow \infty} f(x) = 2$$

$$\lim_{x \rightarrow -1.5^-} f(x) = \text{DNE}$$

Can you describe all parts of the graph using limits?



$$\lim_{x \rightarrow -\infty} f(x) = 0$$

$$\lim_{x \rightarrow -4^-} f(x) = \text{DNE}$$

$$\lim_{x \rightarrow -4^+} f(x) = \text{DNE}$$

$$\lim_{x \rightarrow 2^-} f(x) = \text{DNE}$$

$$\lim_{x \rightarrow 2^+} f(x) = \text{DNE}$$

$$\lim_{x \rightarrow \infty} f(x) = 0$$

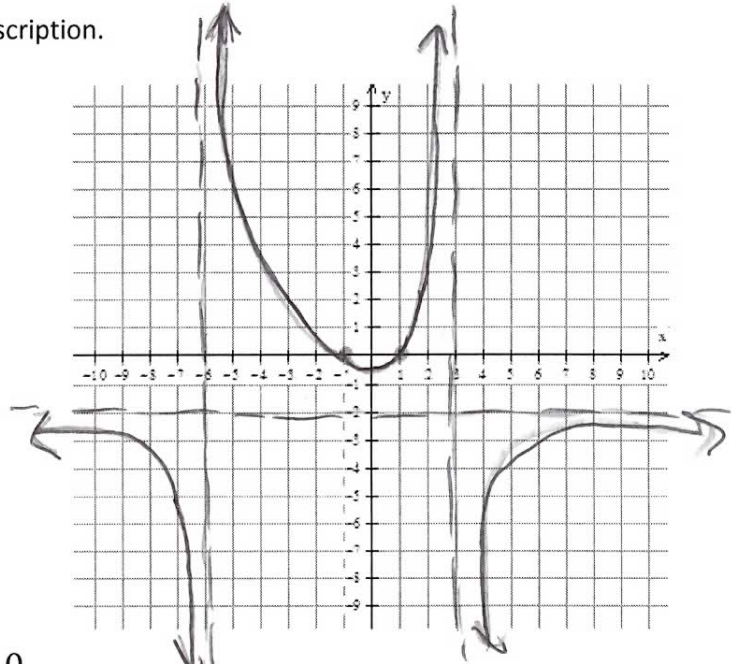
Can you write the equation for this graph?

HA: $y = 0$
 VA: $x = -4, x = 2$
 xint: $x = -1$
 no holes

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

Draw the graph to fit the following description.

- a. $\lim_{x \rightarrow -\infty} f(x) = -2$
- b. $\lim_{x \rightarrow \infty} f(x) = -2$
- c. $\lim_{x \rightarrow -6^-} f(x) = -\infty$
- d. $\lim_{x \rightarrow -6^+} f(x) = \infty$
- e. $\lim_{x \rightarrow 3^-} f(x) = \infty$
- f. $\lim_{x \rightarrow 3^+} f(x) = -\infty$
- g. $f(-1) = 0$ and $f(1) = 0$



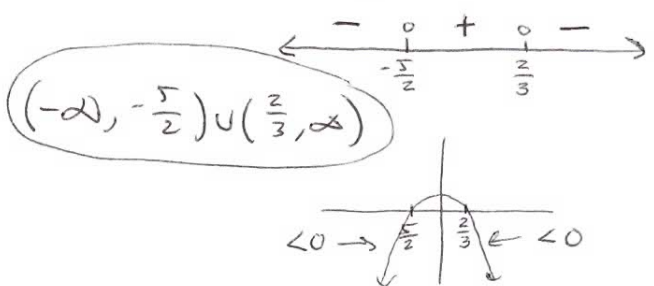
Write the equation _____

HA: $y = -2$
 VA: $x = -6, x = 3$
 no holes
 x-int: $x = -1, x = 1$

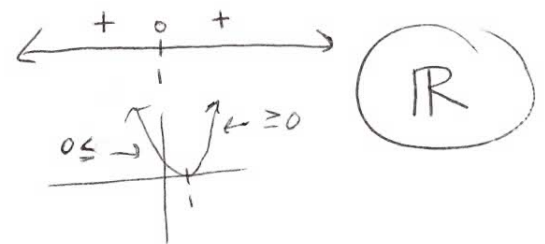
$$y = \frac{-2(x-1)(x+1)}{(x+6)(x-3)}$$

Solving equations and inequalities with polynomial and rational expressions graphically.

1. $(3 - 2x)(2x + 5) < 0$
 $3 - 2x = 0 \quad 2x + 5 = 0$
 $x = \frac{3}{2} \quad x = -\frac{5}{2}$



2. $x^2 - 2x + 1 \geq 0$
 $(x-1)(x-1) \geq 0$
 $x = 1 \quad x = 1$



rational root test:

\pm factors of constant term
leading coefficient

possibilities of roots:

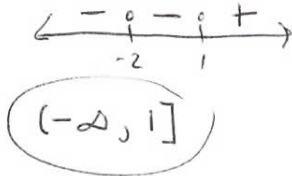
$\pm 1, 2, 4$
1

$\frac{1}{1}, \frac{-1}{1}, \frac{2}{1}, \frac{-2}{1}, \frac{4}{1}, \frac{-4}{1}$

test them by plugging them in and see if you get zero.

3. $x^3 + 3x^2 \leq 4$
 $x^3 + 3x^2 - 4 \leq 0$

+1 works $(x-1)(x^2+4x+4) \leq 0$
 $(x-1)(x+2)(x+2) \leq 0$
 $x=1 \quad x=-2$

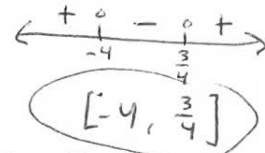


$$\begin{array}{r} x^2 + 4x + 4 \\ x-1 \overline{) x^3 + 3x^2 + 0x - 4} \\ \underline{-x^3 - x^2} \\ 4x^2 + 0x \\ \underline{-4x^2 - 4x} \\ 4x - 4 \\ \underline{4x - 4} \\ 0 \end{array}$$

4. $4x^2 + 6x \leq 12 - 7x$
 $4x^2 + 13x - 12 \leq 0$

	x	4	-4p
4x	$4x^2$	$16x$	$16 + -3 = 13$
-3	$-3x$	-12	

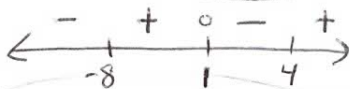
$(4x-3)(x+4) \leq 0$
 $x = \frac{3}{4} \quad x = -4$



5. $\frac{x+1}{(x-4)(x+8)} \geq 0$

$x+1 \geq 0$
 $x \geq -1$

VA: $x=4, x=-8$



$(-8, -1] \cup [4, \infty)$

6. $\frac{4x-2}{x+1} \geq -2$

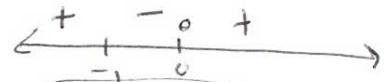
$\frac{4x-2}{x+1} + 2 \geq 0$

$\frac{4x-2}{x+1} + \frac{2x+2}{x+1} \geq 0$

$\frac{6x}{x+1} \geq 0$

$6x \geq 0$
 $x \geq 0$

VA: $x = -1$



$(-1, 0] \cup [0, \infty)$

7. $\frac{4x-28}{(x-5)(x+1)} \geq 2$

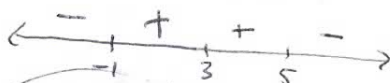
$4x-28 \geq 2x^2-8x-20$

$0 \geq 2x^2-12x+18$

$0 \geq x^2-6x+9$

$0 \geq (x-3)(x-3)$

$x=3$ VA: $x=5, -1$



$(-1, 3)$