Unit 4 Review Day

Warm Up: $f(x)=\dfrac{x^2-4}{2x^2+11x+14}$

Domain:	Range:	Vertical Asymptote:	Horizontal Asymptote:	Removable POINT:
X-intercept:	Y-intercept:	Increasing:	Decreasing:	Hole:
Infinite discont.:	$\lim_{x\to\infty} f(x)$	$\lim_{x\to-\infty} f(x)$	$\lim_{x\to-2} f(x)$	$\lim_{x\to-\frac{7}{2}} f(x)$
Absolute Min:	Absolute Max:	Relative Min:	Relative Max:	Continuous?

Warm Up: $f(x)=\dfrac{x^2-4}{2x^2+11x+14}$

Domain: $(-\infty,-\frac{7}{2})\cup(-\frac{7}{2},-2)\cup(-2,\infty)$	**Range:** $(-\infty,-\frac{4}{3})\cup(-\frac{4}{3},\frac{1}{2})\cup(\frac{1}{2},\infty)$	**Vertical Asymptote: x = -7/2**	**Horizontal Asymptote: y=1/2**	**Removable POINT: (-2, -4/3)**
X-intercept: **(2, 0)**	Y-intercept: **(0, -2/7)**	Increasing: $(-\infty,-\frac{7}{2})\cup(-\frac{7}{2},-2)\cup(-2,\infty)$	Decreasing: **NONE**	Hole: **(-2, -4/3)**
Infinite discont.: **X=-7/2**	$\lim\limits_{x\to\infty} f(x)$ **1/2**	$\lim\limits_{x\to-\infty} f(x)$ **1/2**	$\lim\limits_{x\to-2} f(x)$ **-4/3**	$\lim\limits_{x\to-\frac{7}{2}} f(x)$ **DNE**
Absolute Min: **NONE**	Absolute Max: **NONE**	Relative Min: **NONE**	Relative Max: **NONE**	Continuous? **NO!**

Questions on last night's HW?

- Packet p. 10-12

Tonight's HW

- Test Review sheet (Potatoes one)

Unit 4 Summary

Domain: Consider the **vertical asymptotes** and the **x-value** of the **hole (if they exist)** and **x-intercept** (esp. for sq. roots)

Range: Consider the **horizontal asymptotes** and the **y-value** of the **hole (if they exist)** and **x-intercept** (esp. if HA: y = 0)

Limits: Consider holes, horizontal asymptotes, end behavior

x-intercept: Set **y = 0** and solve for **x**.

y-intercept: Set **x = 0** and solve for **y**.

Min/Max:

Y-value occurs at x-value

Inc/Dec:

Write in terms of x-values!

Use brackets for max/min

Unit 4 Summary (continued)

A function is **EVEN** if $\boxed{f(-x) = f(x)}$ -> Symm. over y-axis

A function is **ODD** if $\boxed{f(-x) = -f(x)}$ -> Symm. about origin

<u>Combinations and Compositions</u>

- Add: (f + g) (x) = f(x) + g(x)
- Subtract: (f - g) (x) = f(x) – g(x)
- Multiply: (f • g) (x) = f(x) • g(x)
- Divide: (f/g) (x) = f(x)/g(x)

(f∘g)(x) = f(g(x)) *consider domain of g(x) and f(g(x))

(g∘f)(x) = g(f(x)) *consider domain of f(x) and g(f(x))

More Limits Practice Sheet

Test Review Scavenger Hunt Game

Quiz Corrections

- On a NEW sheet of notebook paper
- Required if below 80% on Quiz
- Use table format (see side board)

- Show your work for completing them (graph, diagram, etc), NOT just answers!
- Ask questions

- When done, work on Test Review HW! ☺

- Phones stay in the red pockets until you are completely finished with the Review HW and Quiz Corrections!

Next slides used earlier for Fall ‘18

Limits Algebraically Practice Sheet

Practice Continues ->

Warm-Up Review Day!

1. Write an equation of a rational function with Removable Discontinuity at 7, Non-Removable Discontinuity at -2, and Horizontal Asymptote of y = 3/4

2. State the following and graph

$$g(x) = \frac{2x^2 - 10x + 8}{4x^2 - 4x}$$

- Domain:
- Range:
- x & y intercepts:
- Removable Discontinuity:
- Non-Removable Discontinuity:
- Horizontal Asymptote:
- Limits at discontinuities:
- End Behavior using limits:

Warm-Up Answers

1. Write an equation of a rational function with Removable Discontinuity at 7, Non-Removable Discontinuity at -2, and Horizontal Asymptote of y = 3/4

$$Example:$$

$$f(x) = \frac{3x(x-7)}{4(x-7)(x+2)}$$

Warm-Up ANSWERS ~

$$g(x)=\frac{2x^2-10x+8}{4x^2-4x}=\frac{2(x^2-5x+4)}{4x(x-1)}=\frac{2(x-4)(x-1)}{4x(x-1)}$$

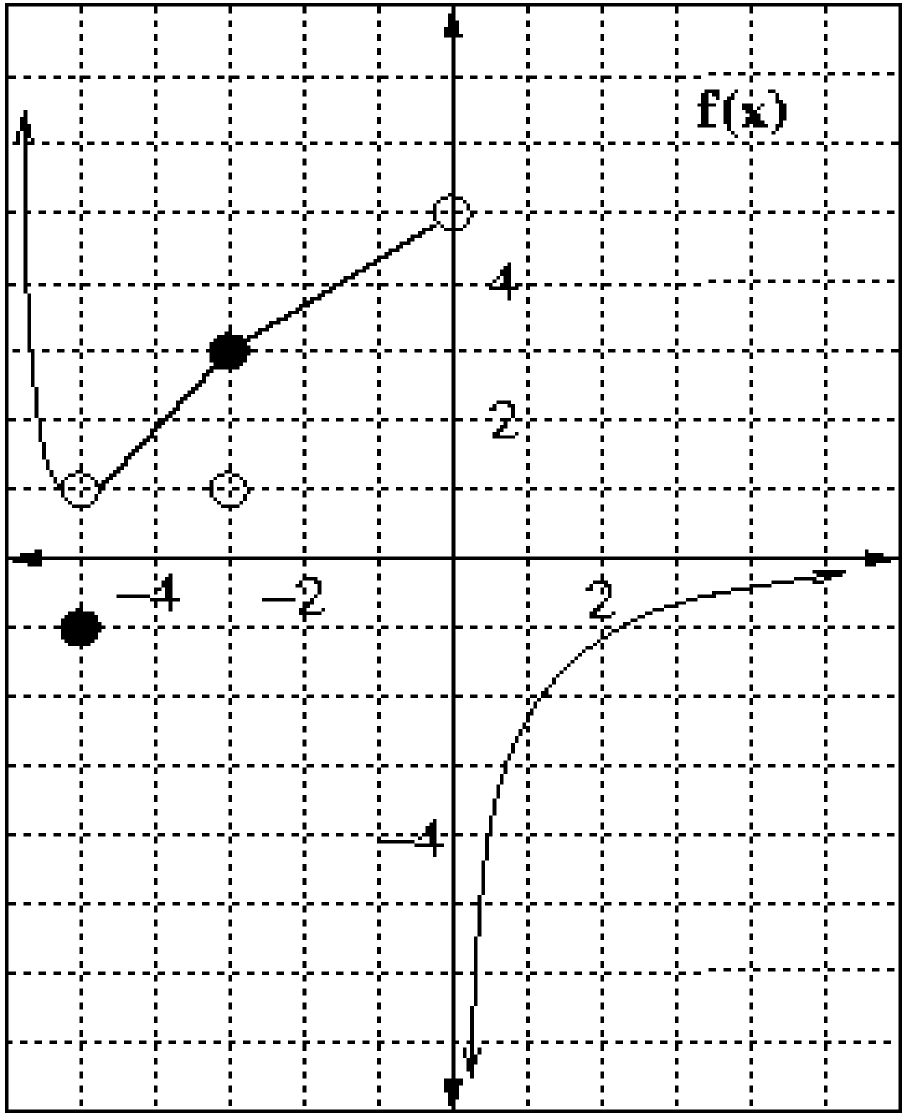
State the following and graph

- Domain: $(-\infty,0)\cup(0,1)\cup(1,\infty)$
- Range: $(-\infty,-\tfrac{3}{2})\cup(-\tfrac{3}{2},\tfrac{1}{2})\cup(\tfrac{1}{2},\infty)$
- x & y intercepts: **x-int: (4, 0)** **y-int: NONE**
- Removable Discontinuity: **Hole: (1, -3/2)**
- Non-Removable Discontinuity: **VA: x = 0**
- Horizontal Asymptote: **HA: y = 1/2**
- Limits at discontinuities: $\lim_{x\to 1} f(x)=-\tfrac{3}{2}$ $\lim_{x\to 0} f(x)=DNE$
- End Behavior using limits: $\lim_{x\to \infty} f(x)=\tfrac{1}{2}$ $\lim_{x\to -\infty} f(x)=\tfrac{1}{2}$

Practice Review Day

Using the graph of *f(x)* below, find the following limits.

1. $\lim_{x \to -5} f(x)$
2. $\lim_{x \to -3} f(x)$
3. $\lim_{x \to -\infty} f(x)$
4. $\lim_{x \to 0^-} f(x)$
5. $\lim_{x \to \infty} f(x)$
6. $\lim_{x \to 0} f(x)$
7. $f(-5)$

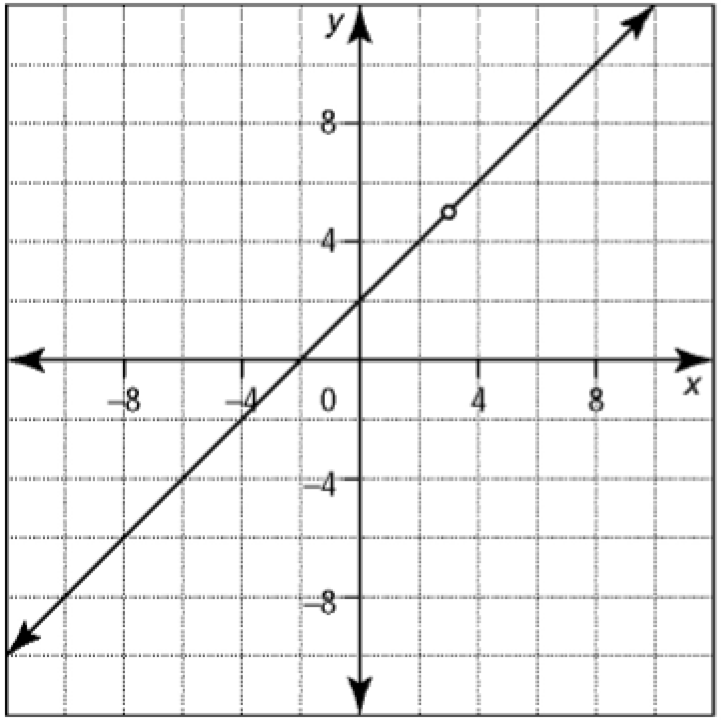


Practice Continues ->

Practice Review Day (continued)

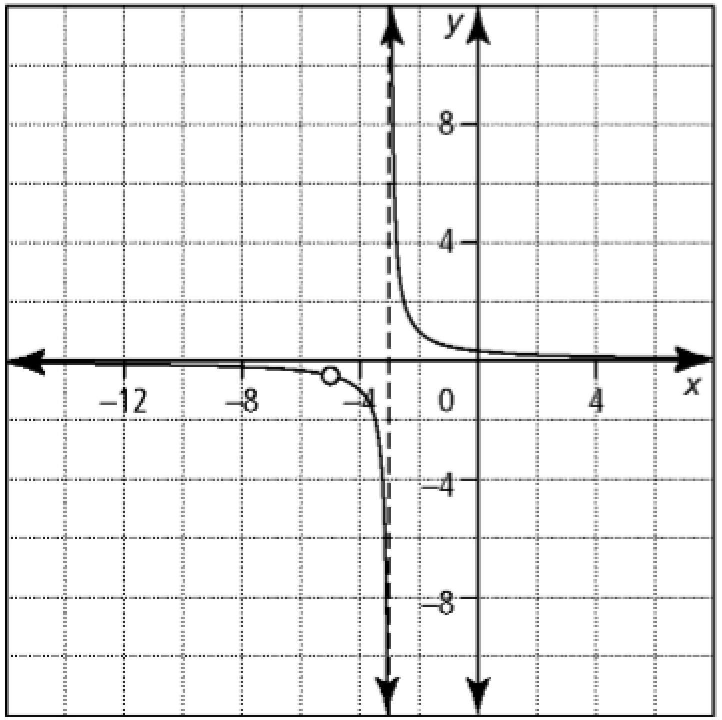
Write an equation for the graphed rational function.

8.



Hole (3, 5)

9.

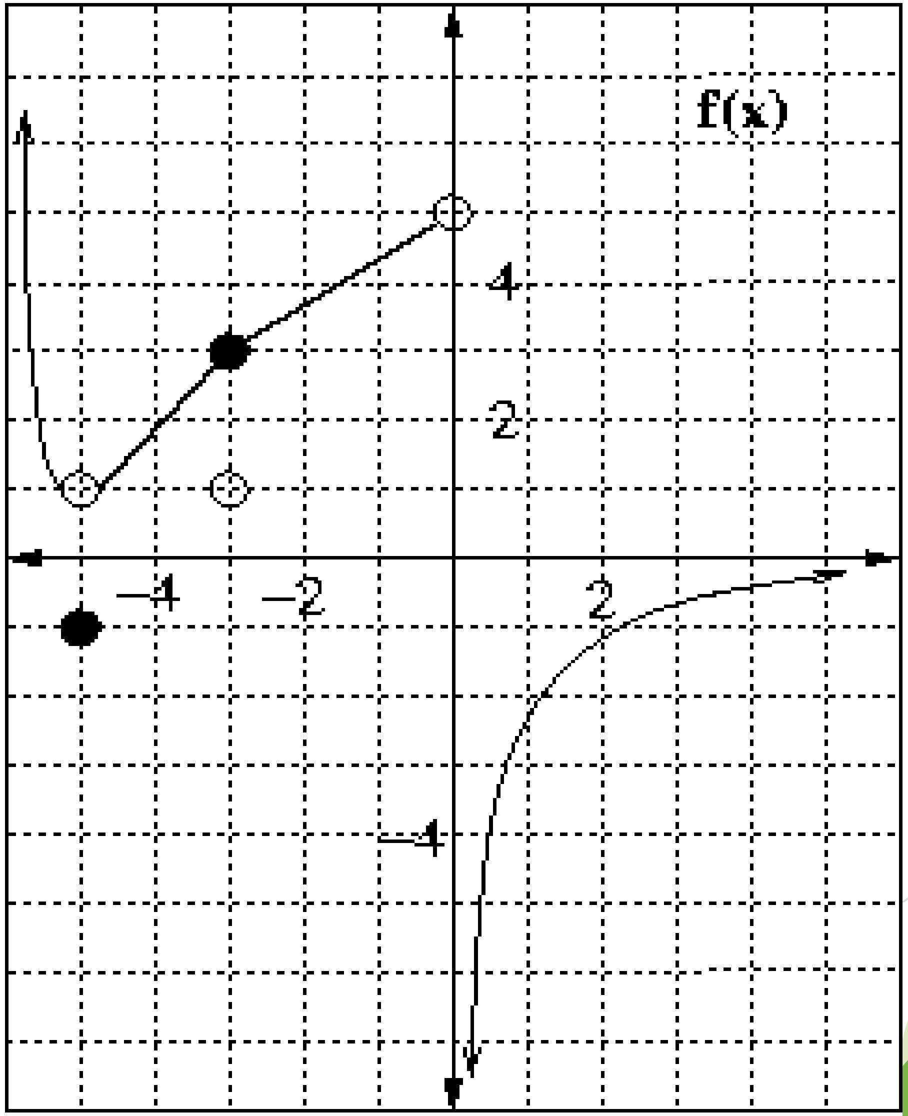


Hole (-5, -1/2)

Practice Review Day: ANSWERS

Using the graph of *f(x)* below, find the following limits.

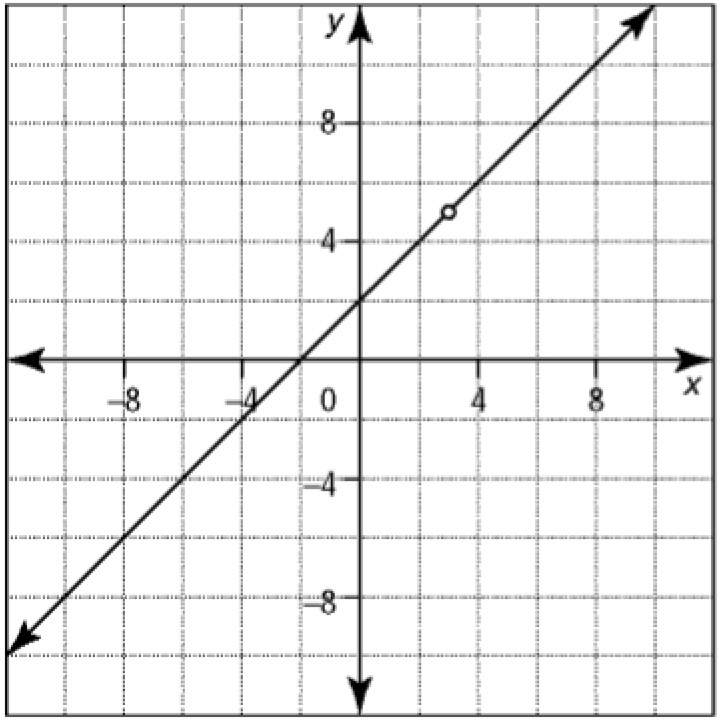
1. $\lim_{x\to -5} f(x) = 1$
2. $\lim_{x\to -3} f(x) = 3$
3. $\lim_{x\to -\infty} f(x) = \infty$
4. $\lim_{x\to 0^-} f(x) = 5$
5. $\lim_{x\to \infty} f(x) = 0$
6. $\lim_{x\to 0} f(x)$ *DNE*
7. $f(-5) = -1$



Practice Review Day: ANSWERS

Write an equation for the graphed rational function.

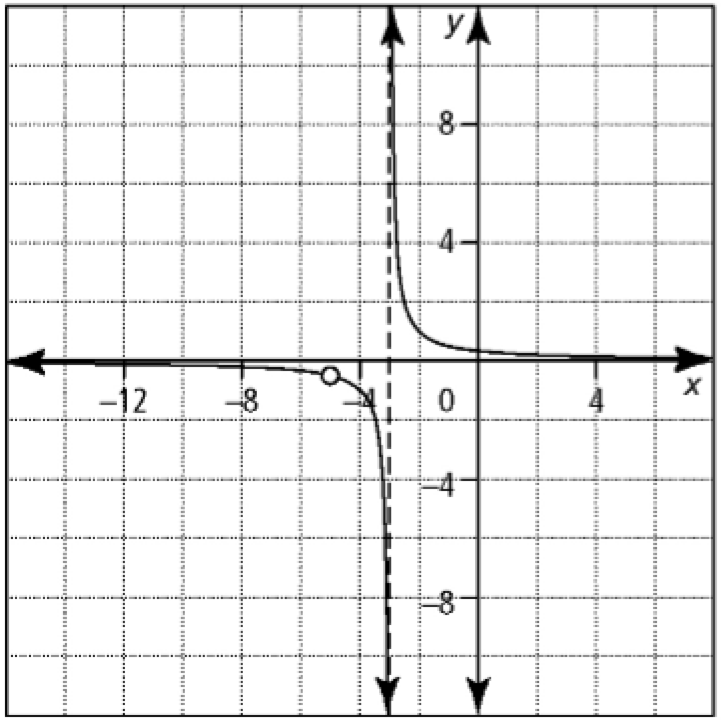
8.



Hole (3, 5)

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

9.



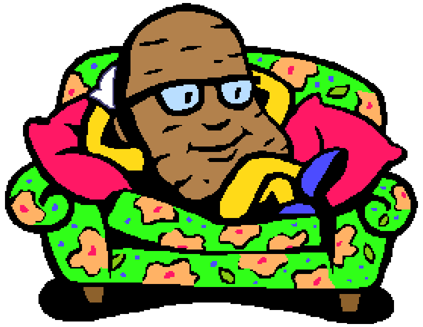
Hole (-5, -1/2)

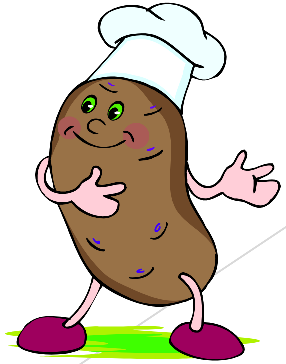
$$y = \frac{(x+5)}{(x+5)(x+3)}$$

Mr. Potato Head Review

With your assigned group of 3 or 4

- 1 person can pick up a set of questions and a Mr. Potato Head
- After you complete each set, you may check your answers with me. If all are correct, you will choose 1 piece to add to Mr. Potato Head
- We will judge the best Mr. Potato Head at the end of class!

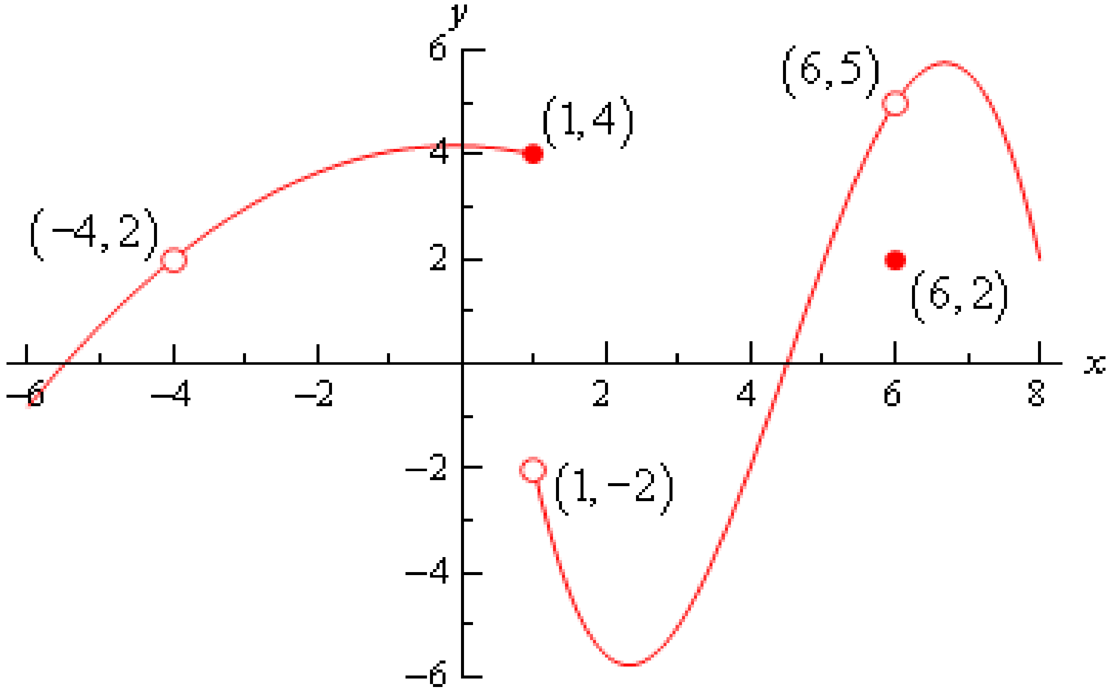




Midterm Review Packet

Using the graph of *f(x)* below, find the following limits.

1. $\lim_{x \to 1} f(x)$
2. $\lim_{x \to 1^-} f(x)$
3. $\lim_{x \to -4} f(x)$
4. $\lim_{x \to -\infty} f(x)$
5. $\lim_{x \to \infty} f(x)$
6. $\lim_{x \to 6} f(x)$
7. $f(6)$



Practice Continues ->

Practice ~

$$g(x) = \frac{\sqrt[3]{x}}{x^2 - x}$$

State the following and make a graph

- Domain:
- Range:
- x & y intercepts:
- Max and Min:
- Increasing:
- Decreasing:
- Limits at discontinuities:
- End Behavior using limits:

Practice ANSWERS ~

$$g(x)=\frac{\sqrt[3]{x}}{x^2-x}$$

State the following and sketch a graph

VA: x = 0 & x = 1

To see the Max and the two VAs, adjust window:

X-min: -5 X-max: 5

Y-min: -5 Y-max: 5

- Domain: $(-\infty,0)\cup(0,1)\cup(1,\infty)$
- Range: $(-\infty,0)\cup(0,\infty)$
- x & y intercepts: NONE
- Max and Min: $\max of -3.07\, at\, x=0.4;\ \min.: none$
- Increasing: $(0,0.4]$
- Decreasing: $(-\infty,0)\cup[0.4,1)\cup(1,\infty)$
- Limits at discontinuities: $\lim_{x\to 0} f(x)=-\infty$ $\lim_{x\to 1} f(x)=DNE$
- End Behavior using limits:

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