

Unit 3 Review Day

Warm Up:

$$f(x) = \frac{x^2 - 4}{2x^2 + 11x + 14}$$

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

Phones OF
and in
Blue
Pockets
today!

$$f(x) = \frac{x^2 - 4}{2x^2 + 11x + 14}$$

Day 10 - Unit 3 Review ☆

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Background Layout Theme Transition

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Explore

hole $(-2, -\frac{4}{3})$
 VA $x = -\frac{7}{2}$
 HA $y = \frac{1}{2}$

$f(x) = \frac{x^2 - 4}{2x^2 + 11x + 14} = \frac{(x+2)(x-2)}{(2x+7)(x+2)}$

dom. $(-\infty, -\frac{7}{2}) \cup (-\frac{7}{2}, -2) \cup (-2, \infty)$

range $(-\infty, -\frac{4}{3}) \cup (-\frac{4}{3}, \frac{1}{2}) \cup (\frac{1}{2}, \infty)$

x-int $0 = x - 2$
 $x = 2$
 $(2, 0)$

Day 10 - Unit 3 Review ☆

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Explore

$\lim f(x)$
 $x \rightarrow \infty = \frac{1}{2}$
 $x \rightarrow -\infty = \frac{1}{2}$
 $x \rightarrow -2 = -\frac{4}{3}$
 $x \rightarrow -\frac{7}{2} = \text{DNE}$

$f(x) = \frac{x^2 - 4}{2x^2 + 11x + 14}$

NORMAL FLOAT AUTO REAL RADIAN MP

$(-2, -\frac{4}{3})$

$x = -\frac{7}{2}$

$y = \frac{1}{2}$

Pause Recording (Alt+Shift+P)

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Warm Up:

$$f(x) = \frac{x^2 - 4}{2x^2 + 11x + 14}$$

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 discontin.: X=-7/2	$\lim_{x \rightarrow \infty} f(x)$ 1/2	$\lim_{x \rightarrow -\infty} f(x)$ 1/2	$\lim_{x \rightarrow -2} f(x)$ -4/3	$\lim_{x \rightarrow -\frac{7}{2}} f(x)$ DNE
Absolute Min: NONE	Absolute Max: NONE	Relative Min: NONE	Relative Max: NONE	Continuous? NO!

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

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:

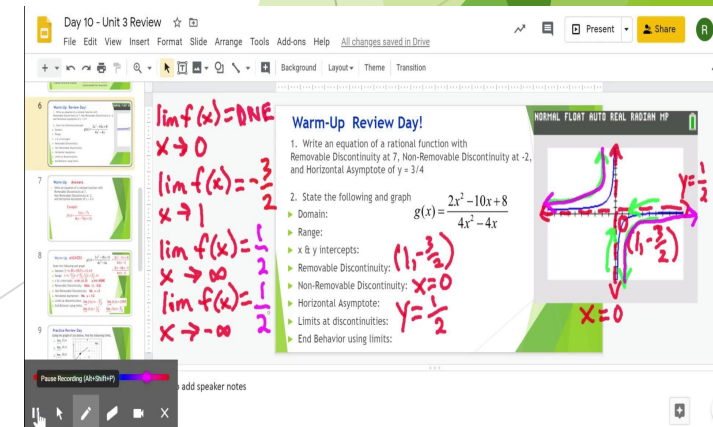
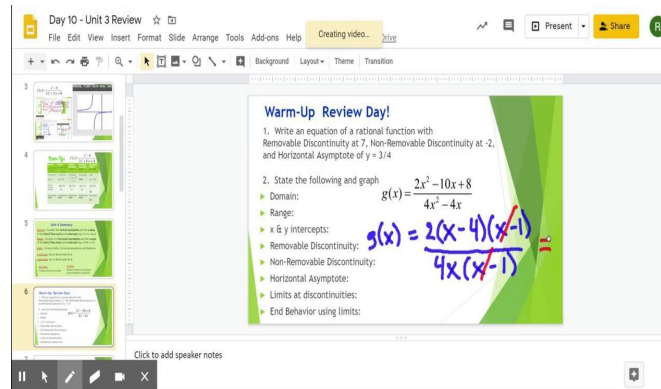
▶ Removable Discontinuity:

▶ 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 :

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

The screenshot shows a Google Slides presentation titled "Day 10 - Unit 3 Review". The slide content is as follows:

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:

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

Handwritten blue annotations on the slide include "VA x=-2" and a horizontal line under "y = 3/4". The presentation interface includes a menu bar (File, Edit, View, Insert, Format, Slide, Arrange, Tools, Add-ons, Help), a toolbar with navigation and editing tools, and a sidebar with a slide thumbnail view. The bottom of the slide shows a "Click to add speaker notes" area and a video player control bar.

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: $(-\infty, -3/2) \cup (-3/2, 1/2) \cup (1/2, \infty)$
- ▶ 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: $\lim_{x \rightarrow 1} f(x) = -3/2$ $\lim_{x \rightarrow 0} f(x) = DNE$
- ▶ End Behavior using limits: $\lim_{x \rightarrow \infty} f(x) = 1/2$ $\lim_{x \rightarrow -\infty} f(x) = 1/2$

Practice Review Day

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

1. $\lim_{x \rightarrow -5} f(x)$

2. $\lim_{x \rightarrow -3} f(x)$

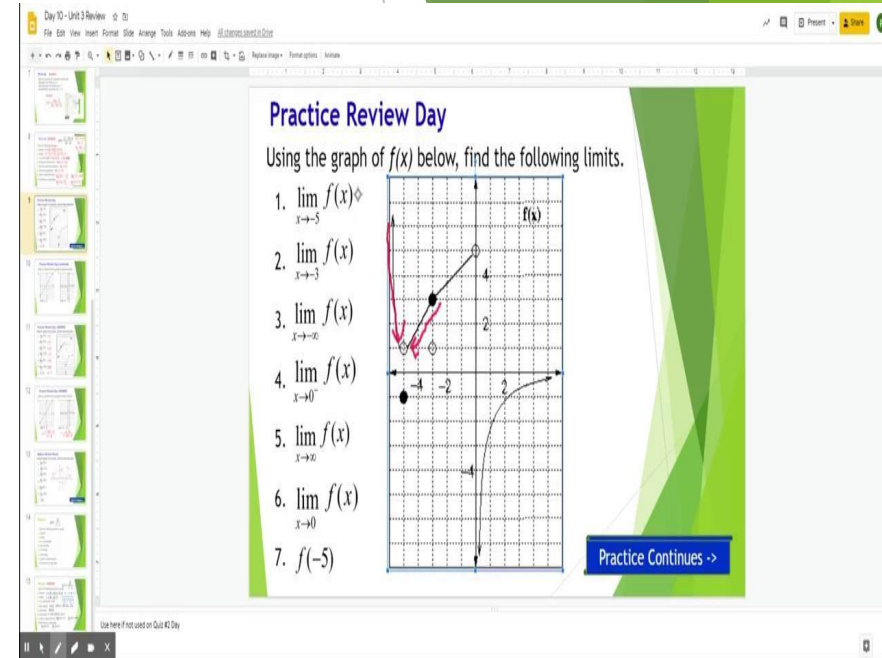
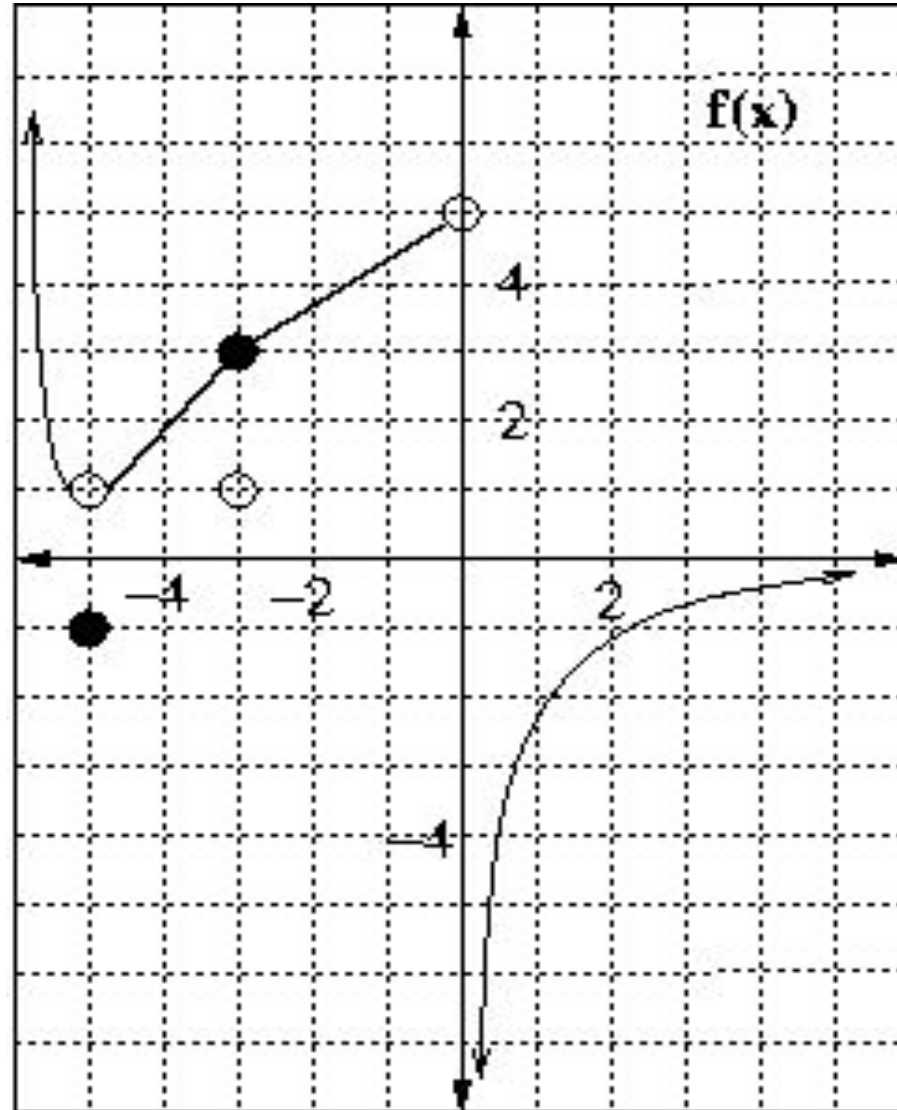
3. $\lim_{x \rightarrow -\infty} f(x)$

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

5. $\lim_{x \rightarrow \infty} f(x)$

6. $\lim_{x \rightarrow 0} f(x)$

7. $f(-5)$

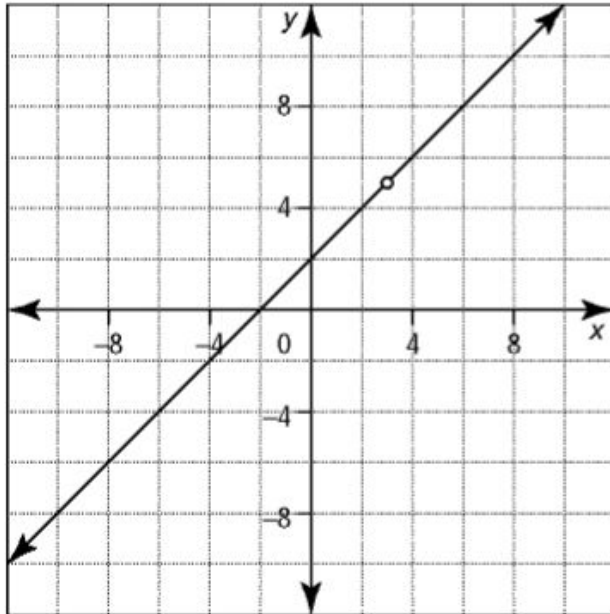


Practice Continues ->

Practice Review Day (continued)

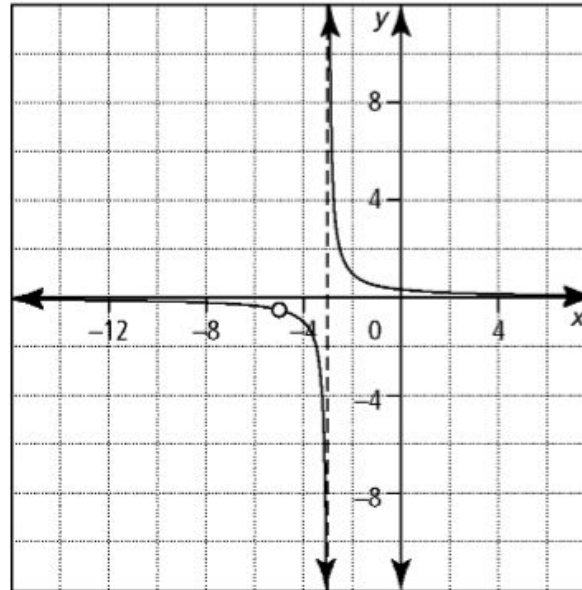
Write an equation for the graphed rational function.

8.

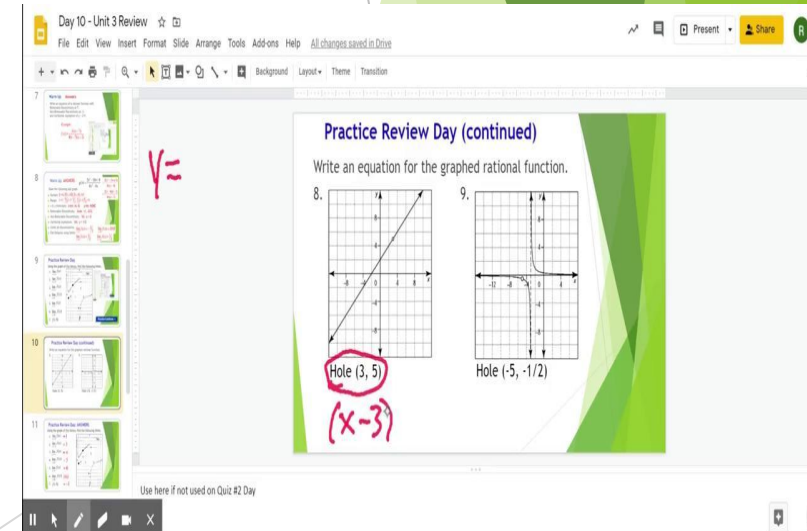


Hole (3, 5)

9.



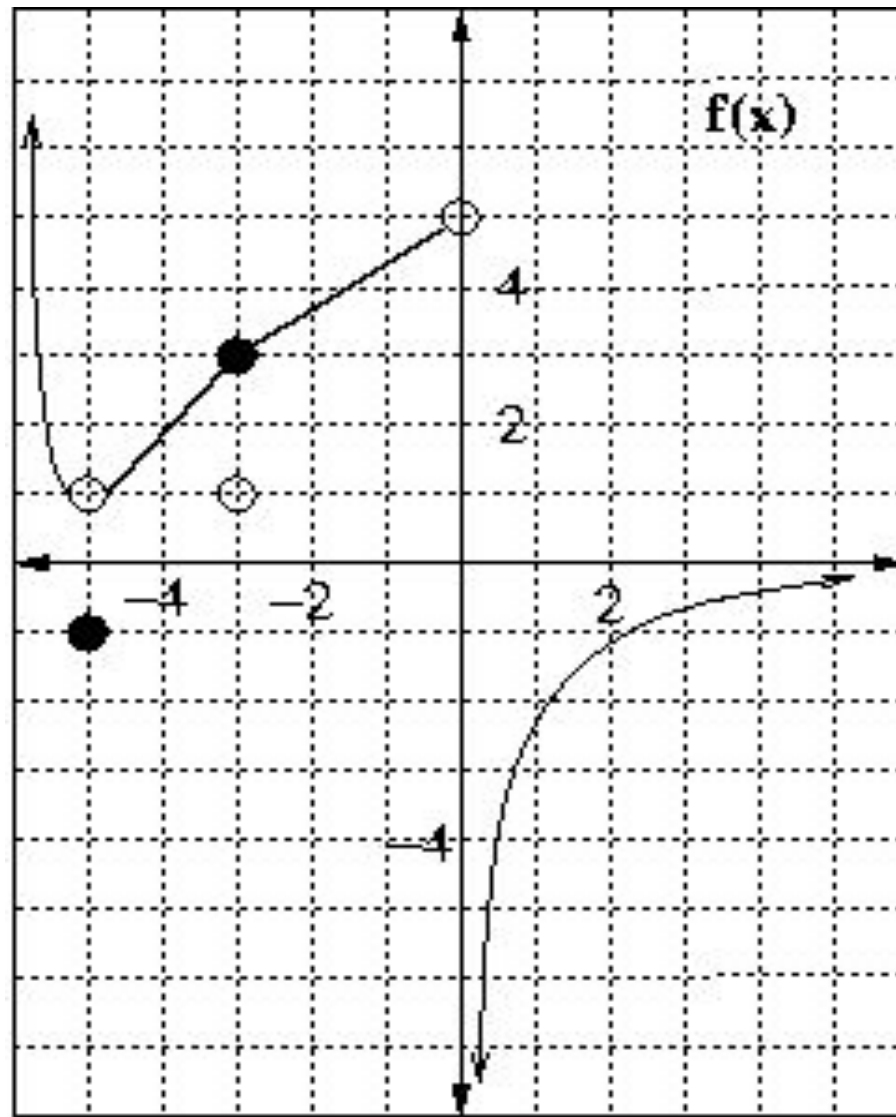
Hole (-5, -1/2)



Practice Review Day: ANSWERS

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

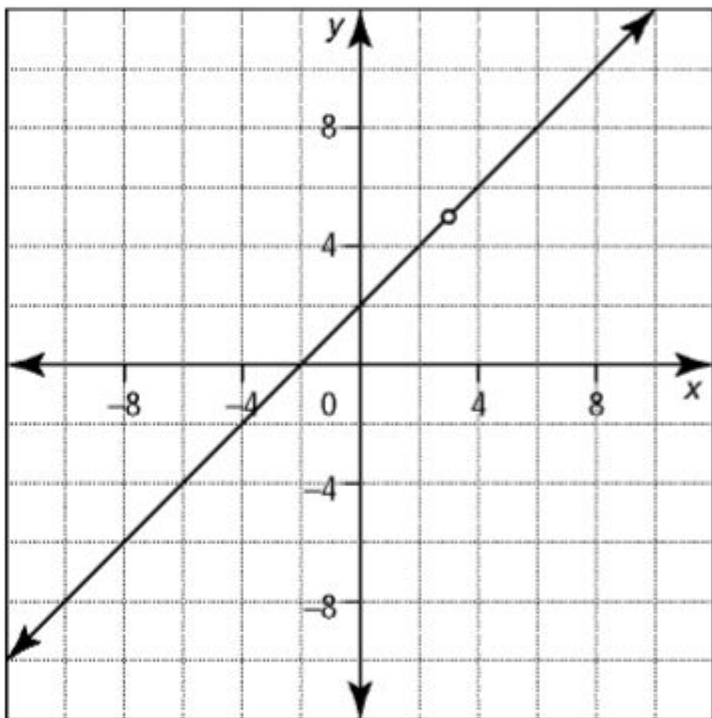
1. $\lim_{x \rightarrow -5} f(x) = 1$
2. $\lim_{x \rightarrow -3} f(x) = 3$
3. $\lim_{x \rightarrow -\infty} f(x) = \infty$
4. $\lim_{x \rightarrow 0^-} f(x) = 5$
5. $\lim_{x \rightarrow \infty} f(x) = 0$
6. $\lim_{x \rightarrow 0} f(x) = DNE$
7. $f(-5) = -1$



Practice Review Day: ANSWERS

Write an equation for the graphed rational function.

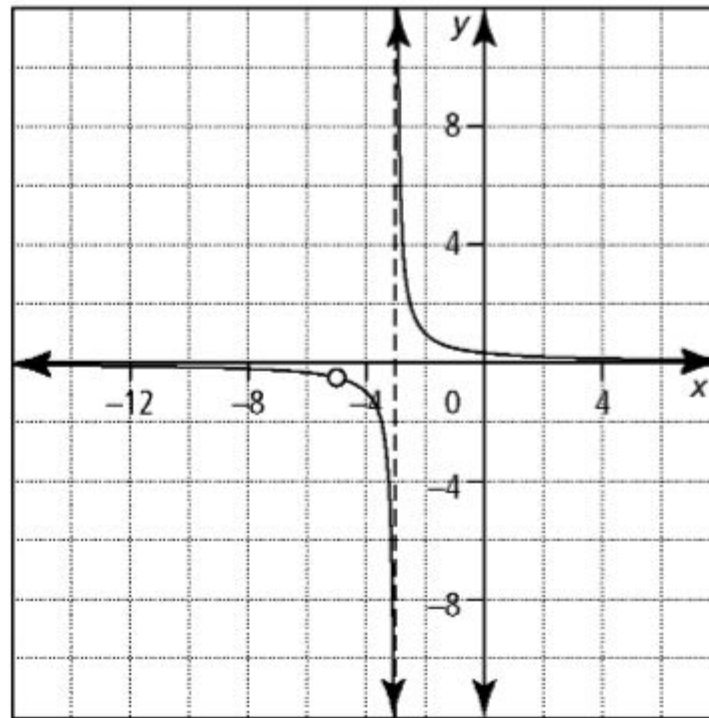
8.



Hole (3, 5)

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

9.



Hole (-5, -1/2)

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

Midterm Review Packet

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

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

2. $\lim_{x \rightarrow 1^-} f(x)$

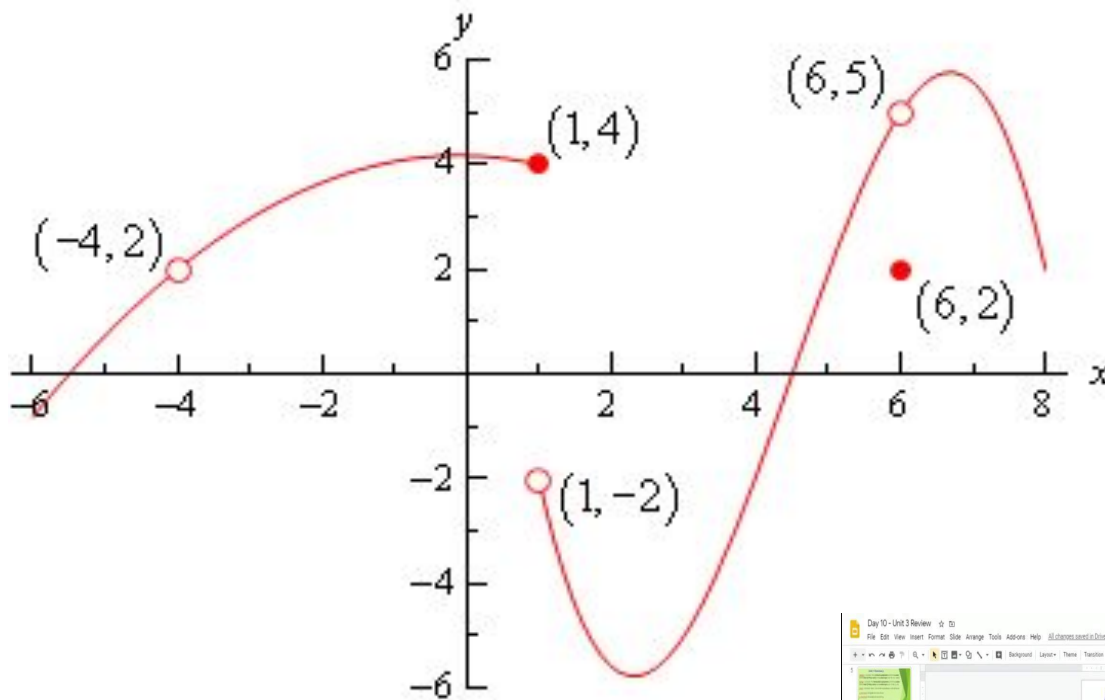
3. $\lim_{x \rightarrow -4} f(x)$

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

5. $\lim_{x \rightarrow \infty} f(x)$

6. $\lim_{x \rightarrow 6} f(x)$

7. $f(6)$



Day 10 - Unit 3 Review

Midterm Review Packet

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

- $\lim_{x \rightarrow 1} f(x)$
- $\lim_{x \rightarrow 1^-} f(x)$
- $\lim_{x \rightarrow -4} f(x)$
- $\lim_{x \rightarrow -\infty} f(x)$
- $\lim_{x \rightarrow \infty} f(x)$
- $\lim_{x \rightarrow 6} f(x)$
- $f(6)$

Practice Continues ->