Ditto

1. a) graph
   b) $\{x \mid x \in \mathbb{R}\}\{y \mid y \leq 3\}$
   c) 0
   d) 3

2. a) $\frac{2}{x^2}, x \neq 0$
   b) $2x-2, x \neq -1$
   c) $\frac{x^3+x^2-x+1}{x+1}, x \neq -1$

4. a) $4x + 2h + 1$
   b) 3

3. $y - 6 = 1(x - 1)$ or $y - 3 = 1(x + 2)$; $y = x + 5$; $x - y + 5 = 0$

Range: FYI

5. a) $\{x \mid x \geq 0\}\{y \mid y \geq 2\}$
   b) $\{x \mid x \neq 2\}\{y \mid y \neq 0\}$
   c) $\left\{x \mid x \geq -\frac{1}{2}, x \neq \frac{3}{2}\right\}\{y \mid y \in \mathbb{R}\}$

C1 Ditto 2:

7. 2x + y - 3 = 0

8. y = 1/3 x + 13/3

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2a) $(f \circ g)(x) = f(g(x))$

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

$x \neq 0$

4a) $f(x) = 2x^2 + x$

$f(x+h) = 2(x+h)^2 + x + h$

$= 2(x^2 + 2xh + \dots$

$= 2(x^2 + 2xh + h^2) + x + h$

$= 2x^2 + 4xh + 2h^2 + x + h$

$DQ = \frac{2x^2 + 4xh + 2h^2 + h - 2x^2}{h}$

$DQ = 4x + 2h + 1$

5c) $f(x) = \frac{\sqrt{2x+1}}{2x-3}$

$2x+1 \geq 0$

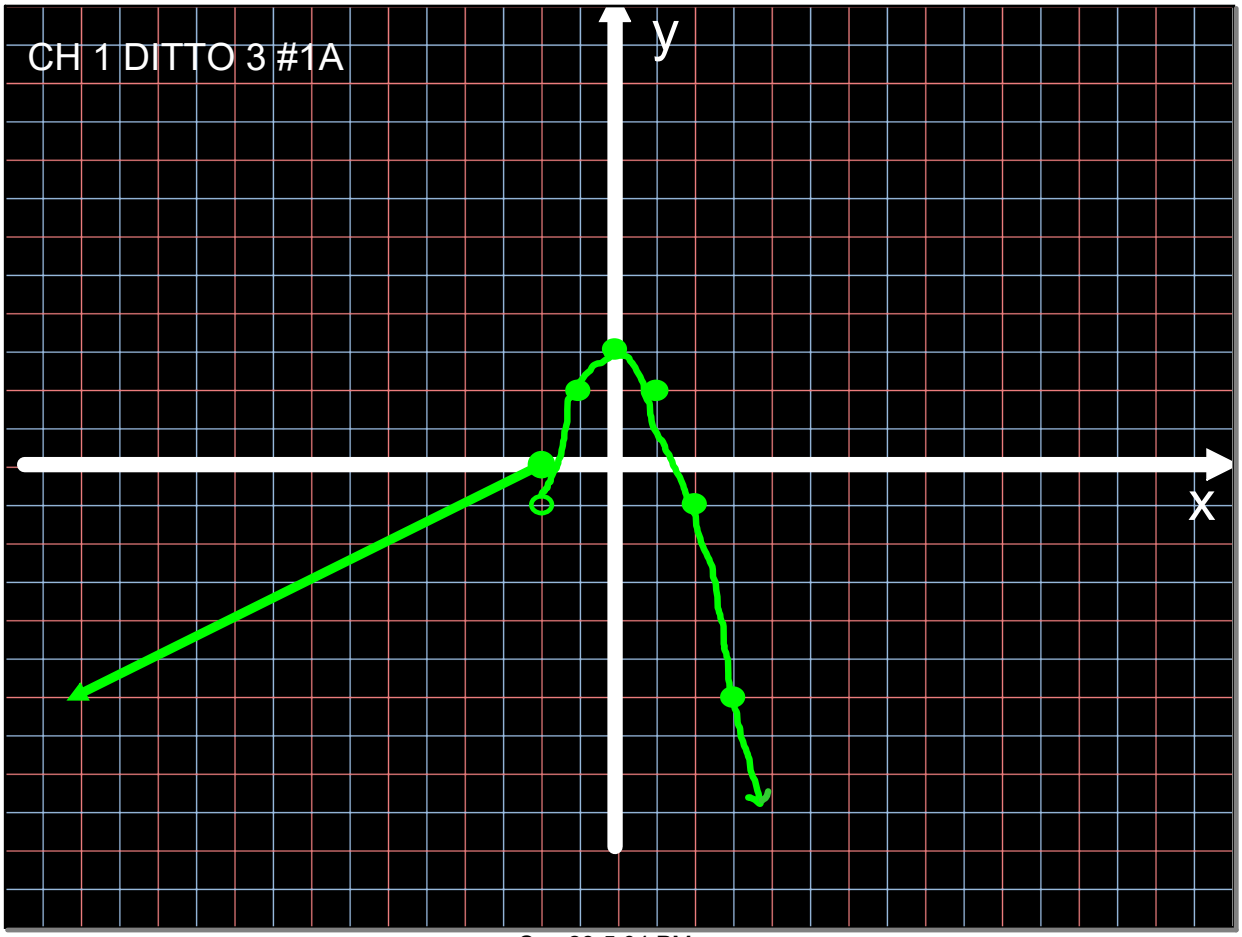
$x \geq -\frac{1}{2}$

$2x-3 \neq 0$

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

$D: \{x \mid x \geq -\frac{1}{2}, x \neq \frac{3}{2}\}$

$[-1/2, 3/2) \cup (3/2, \infty)$



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QUIZ TOMORROW
Thursday GrHW2 due
Friday Test

Be sure to review composite functions and composition. This is not covered in your review!

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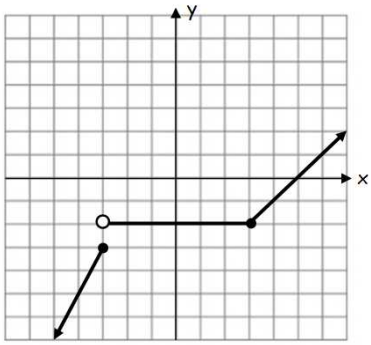
Review For Quiz Ditto

Piecewise Functions: Use the graph to complete the questions below:



Pieces:

1st part equation: $y=2x+3$

2nd part equation: $y=-2$

3rd part equation: $y=x-5$

What x-values does the 1st part equation cover?

$x\leq -3$

What x-values does the 2nd part equation cover?

$-3<x\leq 3$

What x-values does the 3rd part equation cover?

$x>3$

Write the piecewise function:

$$f(x)=\begin{cases}2x+3, & x\leq -3\\ -2, & -3<x\leq 3\\ x-5, & x>3\end{cases}$$

State the domain and range of the function:

$D:\{x\,|\,x\in\mathbb{R}\}$

$R:\{y\,|\,y\leq -3 \text{ or } y\geq -2\}$

Complete the table by evaluating each:

Problem	Evaluate using graph	Evaluate using equation
f(-3)	-3	2(-3)+3=-3
f(-1)	-2	-2
f(3)	-2	-2
f(5)	0	5-5=0

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Graph the following piecewise function, find the asked for values, and state the domain and range.
Be sure to include a table for each section.

$$f(x) = \begin{cases} x+3 & \text{if } x \le -1 \\ x & \text{if } -1 < x \le 0 \\ -x^2 & \text{if } x > 0 \end{cases}$$

$f(x) = x+3$

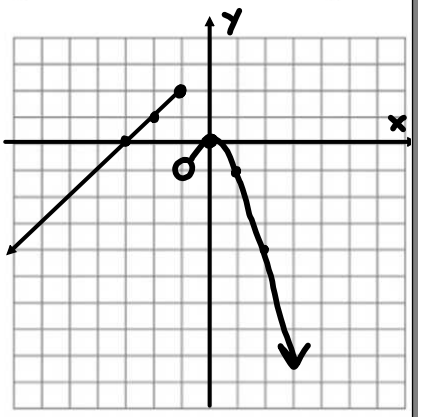
x	y
-1	2
-2	1
-3	0

$f(x) = x$

x	y
-1	-1
0	0

$f(x) = -x^2$

x	y
0	0
1	-1
2	-4



f(-3) = 0

f(0) = 0

f(2) = -4

Domain: $\{x \mid x \in \mathbb{R}\}$

Range: $\{y \mid y \le 2\}$

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Given $f(x) = x^3 - 4x$

Sketch the function.

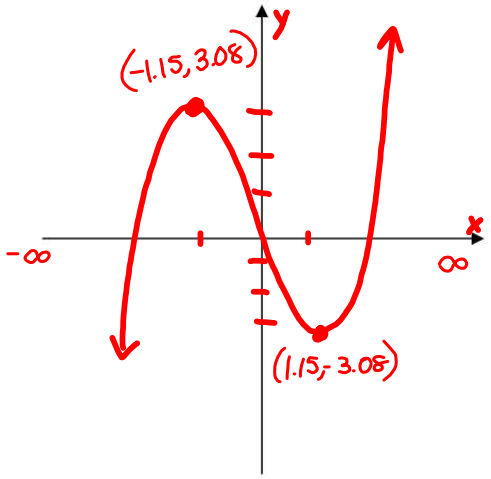
Find the following:

Relative Minimum: -3.08 @ $x = 1.15$

Relative Maximum: 3.08 @ $x = -1.15$

Increasing: $(-\infty, -1.15), (1.15, \infty)$

Decreasing: $(-1.15, 1.15)$



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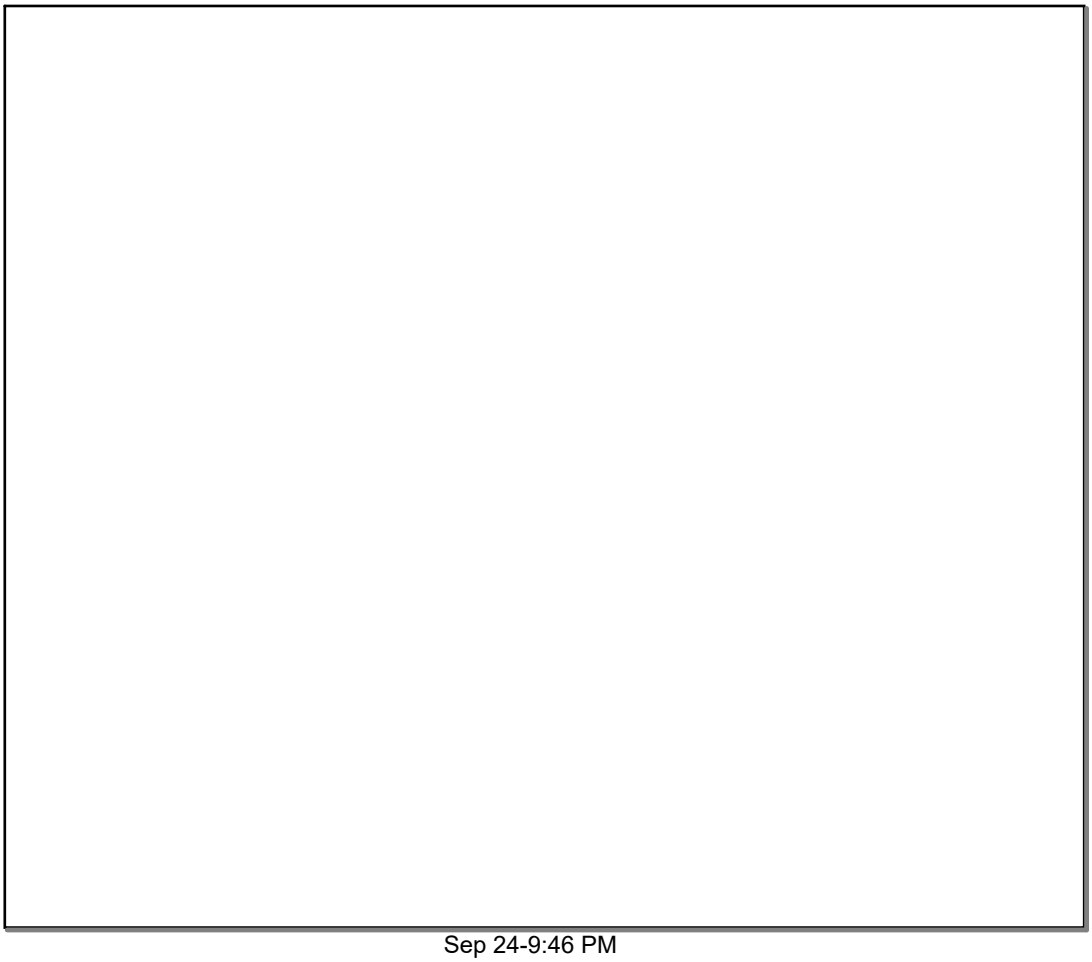

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