Math 3
Unit 1 Day 5 Notes Cont. – Intro to Piecewise Functions

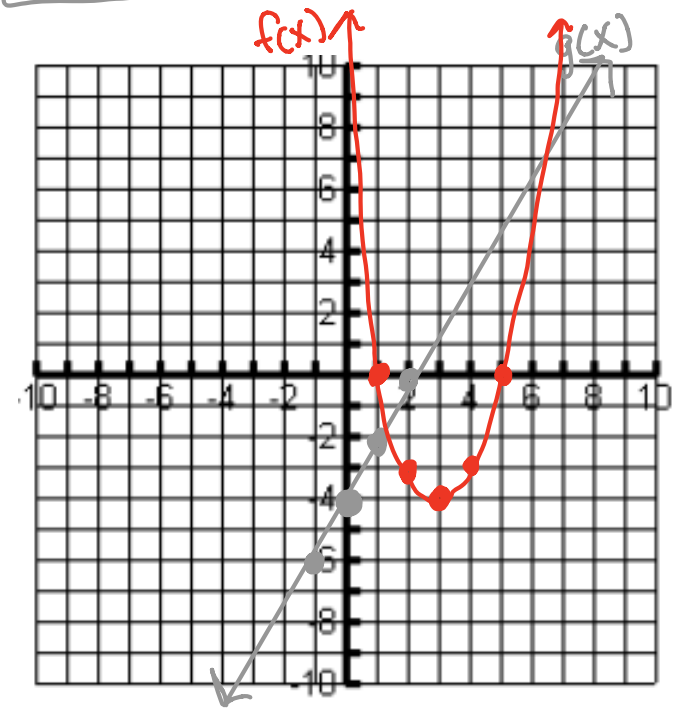
Name: Key
Date: 1

Investigation

Graph the following two functions on the same graph.

$f(x) = (x-3)^2 - 4$ (3, -4) (4, -3) (5, 0)

$g(x) = 2x - 4$



1. Do the equations overlap?

   Yes

2. State the Domain and Range.

   f(x) Domain: $(-\infty, \infty)$

   f(x) Range: $[-4, \infty)$

   g(x) Domain: $(-\infty, \infty)$

   g(x) Range: $(-\infty, \infty)$

3. Are both equations functions?

   Yes

4. Find f(0) and g(0).

$f(0) = (0-3)^2 - 4$

$f(0) = 5$

$g(0) = 2(0) - 4$

$g(0) = -4$

5. How could we make the two functions continuous? What restrictions needed to be added to our equations?

   restrict the domain (x-values)

Definition of Piecewise Functions: function w/ different pieces

≤ or ≥ ●

< or > ○

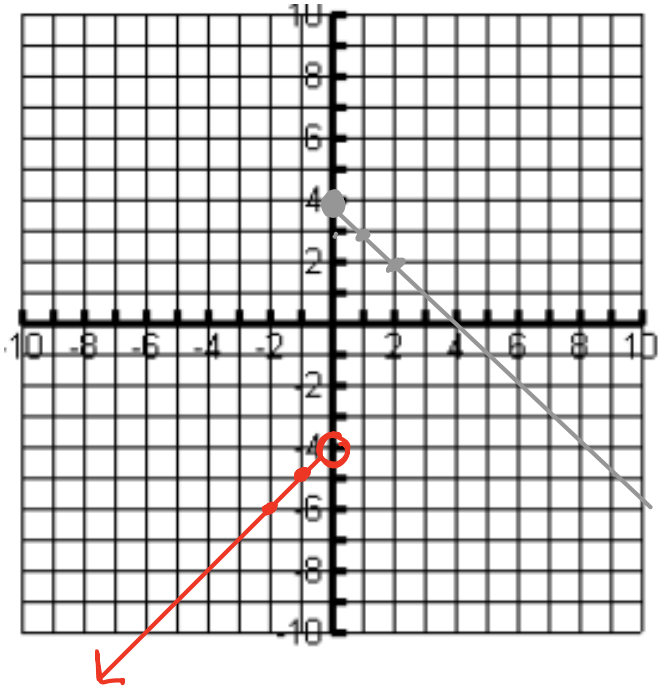
Example 1

Graph the following Piecewise Function. Make sure you restrict your domain for certain "pieces" of the function.

$$f(x)=\begin{cases} x-4, & x<0 \\ -x+4, & x\geq 0 \end{cases}$$

(0, -4) | ○ | $\frac{1}{1}$

(0, 4) | ● | $\frac{-1}{1}$



Example 2

Graph the following Piecewise Function. Make sure you restrict your domain for certain "pieces" of the function.

$$f(x)=\begin{cases} x^2, & x\geq -2 \\ x+8, & x<-2 \end{cases}$$

Vertex: | $(-2)^2$

(0, 0) | (-2, 4) | ● | up

(-2, 6) | (0, 8) | ○ | $\frac{1}{1}$