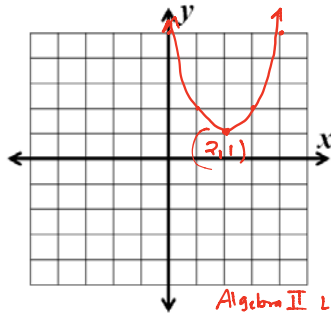


Write your questions and thoughts here!

### Recall:

Quadratic Function:

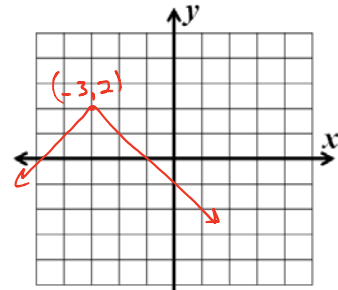
$$f(x) = (x - 2)^2 + 1$$



Algebra II Lesson 5.1

Absolute Value Function

$$f(x) = -|x + 3| + 2$$



Algebra II Lesson 3.2

### Finding the Value

$$1. f(x) = \begin{cases} -x^2 - 2x + 8, & x \leq -3 \\ 3x + x^3, & -2 < x < 5 \\ -|x - 8|, & x \geq 5 \end{cases}$$

$$f(-1) = 3(-1) + (-1)^3 = -3 + (-1) = -4$$

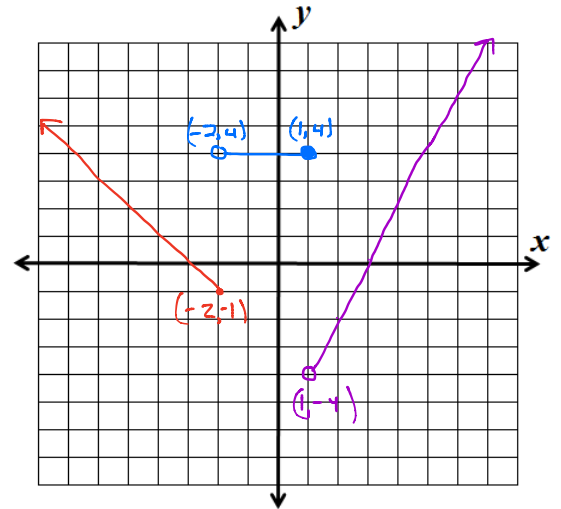
$$f(5) = -|(5) - 8| = -|-3| = -3$$

$$f(-2.5) = \text{DNE.}$$

Not in Domain

### Graphing a Piecewise Function

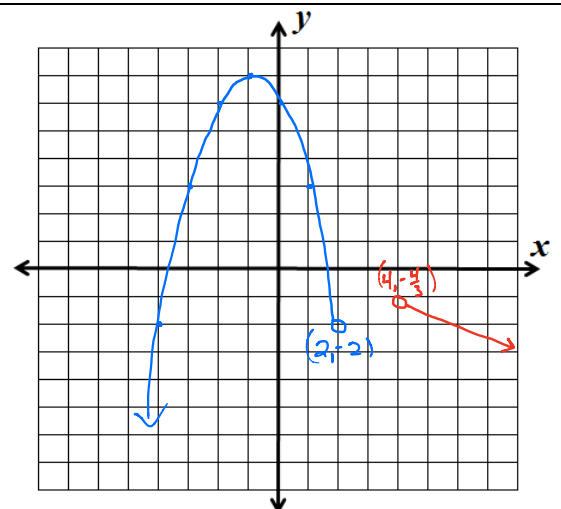
$$2. g(x) = \begin{cases} -x - 3, & x \leq -2 \\ 4, & -2 < x \leq 1 \\ 2x - 5, & x > 1 \end{cases}$$



$$3. h(x) = \begin{cases} -(x + 1)^2 + 7, & x < 2 \\ -\frac{1}{3}x, & x > 4 \end{cases}$$

$$\begin{aligned} h(2) &= -[2+1]^2 + 7 \\ &= -[3]^2 + 7 \\ &= -9 + 7 \\ h(2) &= -2 \end{aligned}$$

$$\begin{aligned} h(4) &= -\frac{1}{3}(4) \\ h(4) &= -\frac{4}{3} \end{aligned}$$



What is piecewise function?

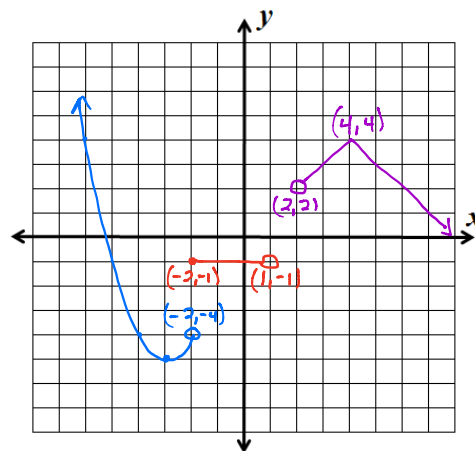


# 3.3 Piecewise Functions

Write your questions and thoughts here!

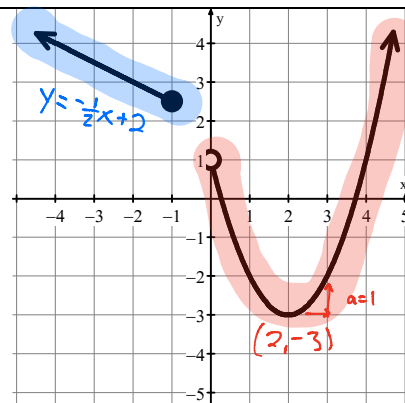


$$4. f(x) = \begin{cases} (x+3)^2 - 5, & x < -2 \\ -1, & -2 \leq x < 1 \\ -|x-4| + 4, & x > 1 \end{cases}$$



5. Write out the function of the graph to the right.

$$f(x) = \begin{cases} -\frac{1}{2}x + 2, & x \leq -1 \\ (x-2)^2 - 3, & x > -1 \end{cases}$$



Tell if the functions are continuous. Show any work that leads to your conclusion.

6.

$$f(x) = \begin{cases} 2x^2 - x + 1, & x < -1 \\ x^3 + 6x^2 + 12x + 11, & x \geq -1 \end{cases}$$

@ x = -1

$$2x^2 - x + 1 = x^3 + 6x^2 + 12x + 11$$

$$2(-1)^2 - (-1) + 1 = (-1)^3 + 6(-1)^2 + 12(-1) + 11$$

$$2 + 1 + 1 = -1 + 6 - 12 + 11$$

$$4 = 4 \quad \therefore \text{CONTINUOUS}$$

7.

$$f(x) = \begin{cases} -x^2 + 8, & x \leq 3 \\ -2 - 3\sqrt{3-x}, & x > 3 \end{cases}$$

@ x = 3

$$-x^2 + 8 = -2 - 3\sqrt{3-x}$$

$$-(3)^2 + 8 = -2 - 3\sqrt{3-3}$$

$$-9 + 8 = -2 - 3\sqrt{0}$$

$$-1 = -2 - 3 \cdot 0$$

$$-1 \neq -2 \quad \therefore \text{NOT CONTINUOUS}$$

Now summarize what you learned!

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## Skillz Review: Solve or evaluate.

1.  $\sqrt{-24} = 2i\sqrt{6}$

2.  $x^2 - 2 = -100$

$$x^2 = -98$$

$$x = \pm\sqrt{-98}$$

$$x = \pm 7i\sqrt{2}$$

3.  $(x+4)^2 - 7 = 57$

$$(x+4)^2 = 64$$

$$x+4 = \pm 8$$

$$x = -12, 4$$

4.  $2(x-9)^2 + 11 = -25$

$$2(x-9)^2 = -36$$

$$(x-9)^2 = -18$$

$$x-9 = \pm\sqrt{-18}$$

$$x = 9 \pm 3i\sqrt{2}$$