# PIECEWISE FUNCTIONS

- Defined according to their _____.
- Domains can't _____.
- If the _____ of 2 pieces is evaluated to be the same for either piece, the function is considered to be _____.

EVALUATING PIECEWISE FUNCTIONS

1.

2.

---

$$f(x)=\begin{cases} x & \text{if } x \le 2 \\ 2 & \text{if } x > 2 \end{cases}$$

f(-3) = f(0) = f(2) = f(5) =

Continuous?

---

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

f(-3) = f(-2) = f(0) = f(2) =

Continuous?

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$$f(x)=\begin{cases} x(x^2+1) & \text{if } x \le -2 \\ 4x + 5 & \text{if } -2 < x < 1 \\ \dfrac{1}{2x+3} & \text{if } x \ge 1 \end{cases}$$

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GRAPHING PIECEWISE FUNCTIONS

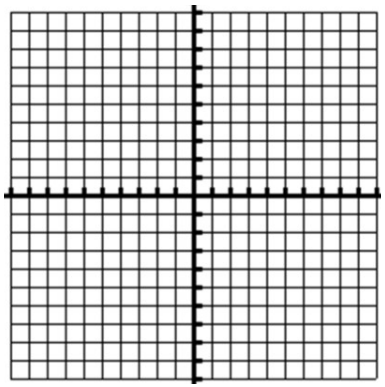
1.

2.

3.

---

Ex. 1 $f(x) = \begin{cases} 2x & if\ x < 4 \\ -x + 12 & if\ x \geq 4 \end{cases}$



D: R:

X-Int: Y-Int:

Inc: Dec:

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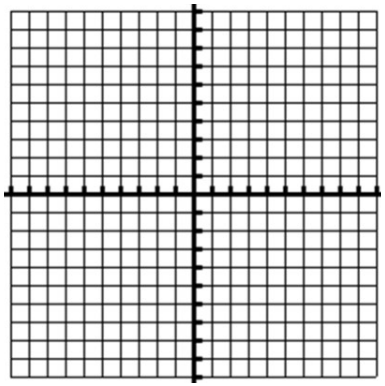
Ex. 2 $f(x) = \begin{cases} x^2 - 4 & if\ x < 2 \\ x - 4 & if\ x \geq 2 \end{cases}$



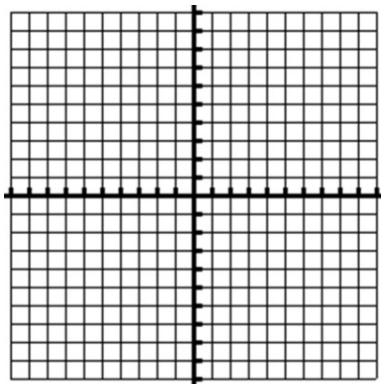
D: R:

X-Int: Y-Int:

Inc: Dec:

---

Ex. 3 $f(x) = \begin{cases} 4 & if\ x < -2 \\ x^2 - 1 & if\ -2 \leq x < 2 \\ -x + 2 & if\ x \geq 2 \end{cases}$



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X-Int: Y-Int:

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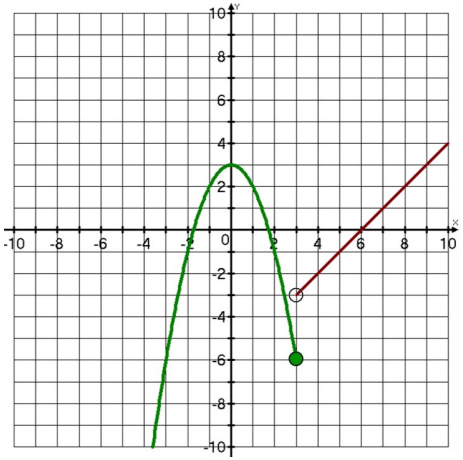
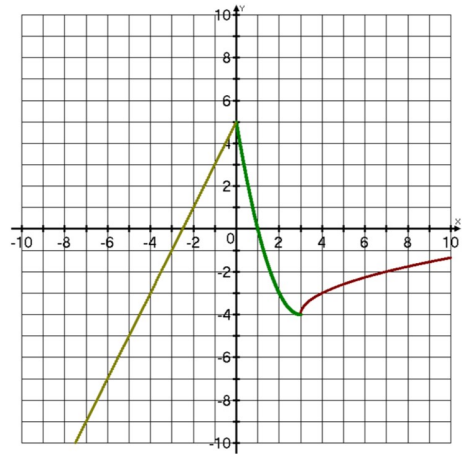
WRITING PIECEWISE FUNCTIONS

1.

2.

3.



# Writing Absolute Value Functions as Piecewise Functions

1. Factor out the coefficient of x, "b".
2. Multiply the outside coefficient "a" by the absolute value of "b". This is your slope, _____.
3. Find the vertex of the absolute value function. This is the point (_____, _____).
4. Write a piecewise function whose domain is restricted by the _____ of the _____.
   a. The left side of the domain is $y - y_1 = -m(x - x_1)$ expanded into slope-intercept form.
   b. The right side of the domain and the vertex is $y - y_1 = m(x - x_1)$ expanded into S-I form.

Example 1:

f(x) = 3 |2x—2| + 5

Example 2:

g(x) = -1/2 |3x + 9| - 2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