

## Today's Plan:

**Learning Target (standard):** I will evaluate and graph piecewise functions. I will determine their domain and range.

**Students will:** Complete practice problems over previous concepts at the boards, put up homework problems on the board and make necessary corrections to their own work, take notes over new material and complete practice problems over new concepts.

**Teacher will:** Provide practice problems over previous concepts, check homework problems for accuracy and provide students feedback, describe and provide examples of new concepts and assign students assessment problems over new concepts.

**Assessment:** Board work, homework check and homework assignment

**Differentiation:** Students will work at the board, go over and correct homework at their seats, actively engage in lecture over new concepts, practice new concepts with the aid of other students and the teacher and complete homework assignment.

## Assignment:

Evaluate each.

$$f(x) = \begin{cases} -2x + 5, & x < -1 \\ 3 - x, & 2 \leq x \leq 5 \\ \frac{1}{2}x, & 5 < x \end{cases}$$

$$g(x) = \begin{cases} 4x - 2, & x < -3 \\ -2x + 1, & -3 \leq x < 6 \\ -x + 3, & x \geq 6 \end{cases}$$

$$a) f(g(-5)) = 49$$

$$b) g(f(0)) = \text{undefined}$$

$$c) g(f(2)) = -1$$

$$d) f(g(-1)) = 0$$

$$e) g(f(3)) = 1$$

\*Write the problem & show ALL steps!\*

Evaluate.

$$f(x) = \begin{cases} -x^2 - 1, & x < 0 \\ 2x - 5, & 2 \leq x \leq 5 \\ -3x, & 5 < x \end{cases}$$

$$g(x) = \begin{cases} 2x^2 + x - 1, & x < -1 \\ |3x + 2|, & 4 \leq x < 8 \\ x - 5, & x \geq 8 \end{cases}$$

a)  $f(g(-2)) = 5$

b)  $g(f(1)) = \text{undefined}$

c)  $g(f(4)) = \text{undefined}$

d)  $f(g(-5)) = -132$

e)  $g(f(2)) = \text{undefined}$

\*Write the problem &  
show ALL steps!\*

Find the domain.

$$f(x) = \sqrt{x^2 - x - 12}$$

$$x^2 - x - 12 \geq 0$$

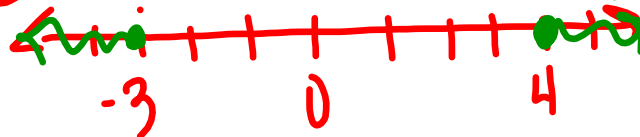
$$(x-4)(x+3) \geq 0$$

$$x-4 \quad - \quad | \quad -$$

$$0 \quad +$$

$$x+3 \quad - \quad | \quad +$$

$$0 \quad +$$

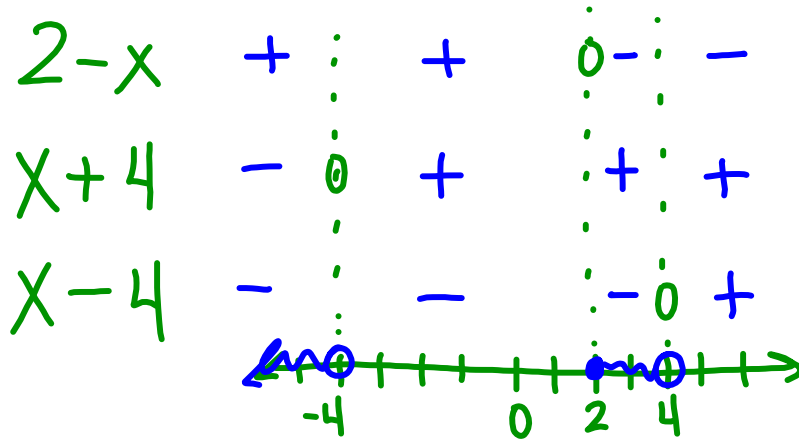


$$D: \{x \mid x \leq -3, x \geq 4\}$$

Find the domain.

$$f(x) = \sqrt{\frac{2-x}{x^2-16}}$$

$$\frac{2-x}{(x+4)(x-4)} \geq 0$$

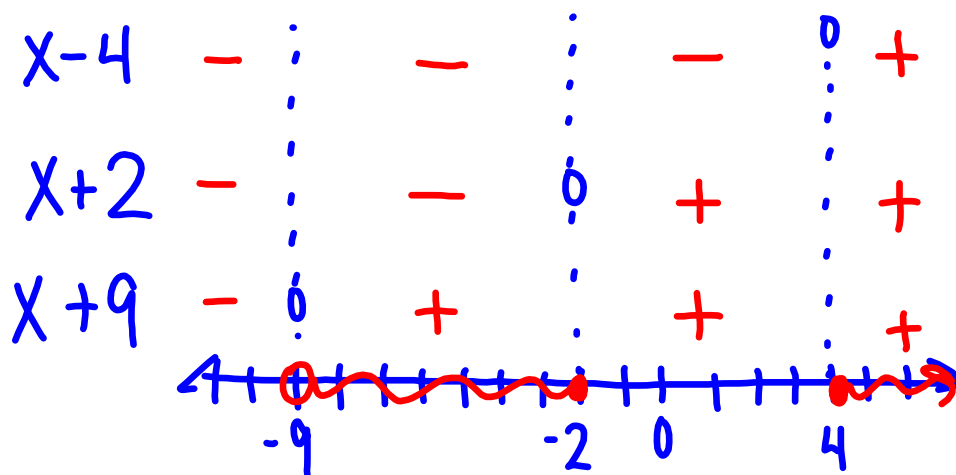


$$D: \{x \mid x < -4, 2 \leq x < 4\}$$

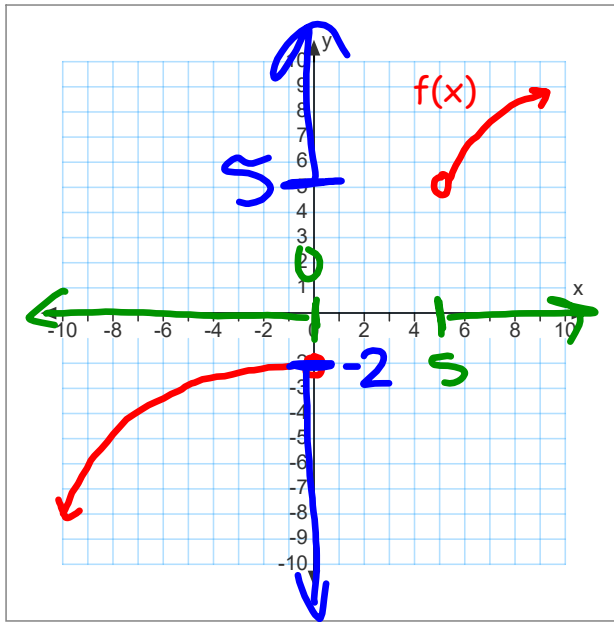
Find the domain.

$$f(x) = \sqrt{\frac{x^2 - 2x - 8}{x+9}}$$

$$\frac{(x-4)(x+2)}{x+9} \geq 0$$

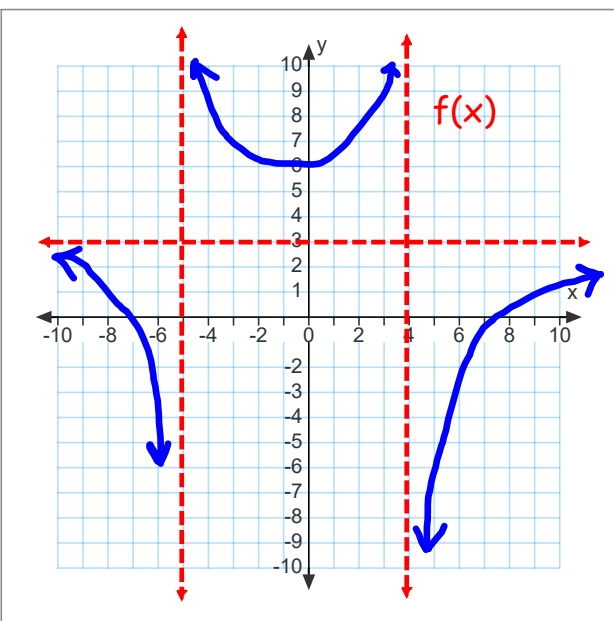


$$D: \{x \mid -9 < x \leq -2, x \geq 4\}$$



$$D: \{x \mid x < 0, x > 5\}$$

$$R: \{y \mid y < -2, y > 5\}$$



$$D: \{x \mid x \neq -5, 4\}$$

$$R: \{y \mid y < 3, y \geq 6\}$$

Evaluate.

$$f(x) = \begin{cases} x^2 + 2, & x < 2 \\ x + 3, & 2 \leq x \leq 5 \\ \frac{1}{2}x, & x > 6 \end{cases}$$

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

b)  $g(f(0)) =$

$$f(0) = 0^2 + 2$$

$$f(0) = 2$$

$$g(2) = 2 - 2$$

$$g(2) = 0$$

$$g(f(0)) = 0$$

a)  $f(g(-5))$

b)  $g(f(0))$

a)  $f(g(-5))$

$$g(-5) = -(-5)$$

$$g(-5) = 5$$

$$f(5) = 5 + 3$$

$$f(5) = 8$$

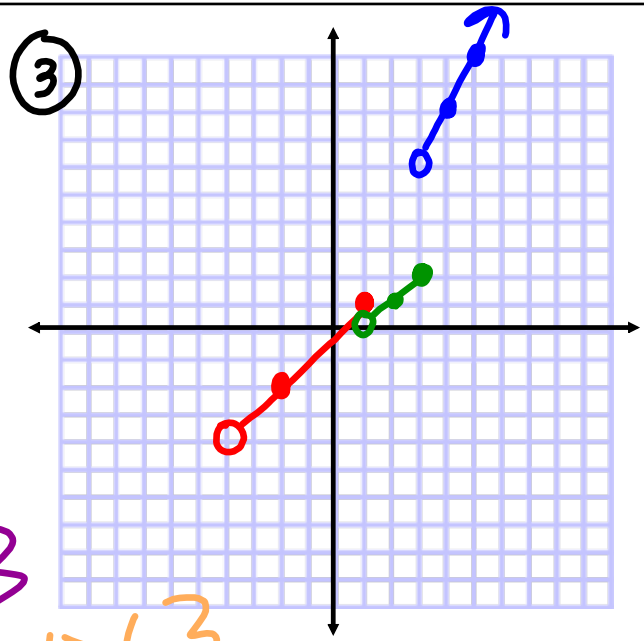
$$f(g(-5)) = 8$$

## Graphing Piecewise Functions:

- Pick at least three x-values in each interval to evaluate the function - must include the endpoints
- Decide whether the endpoints of the interval will create open or closed circles on the graph
- Decide where arrows are appropriate

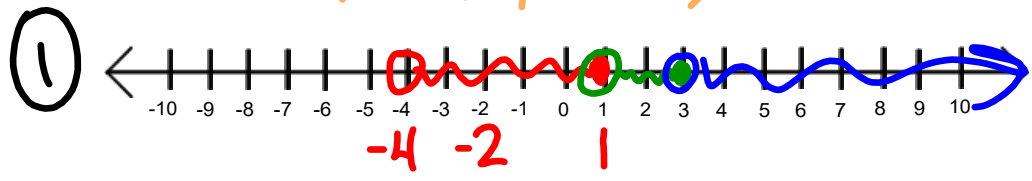
Graph:

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



② D:  $\{x \mid x > -4\}$

④ R:  $\{y \mid -4 < y \leq 2, y > 6\}$



Assignment:

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\* ALL graphing MUST be on graph paper, not notebook paper!!! \*