

## Today's Plan:

**Learning Target (standard):** I will perform operations on functions and determine the domain and range of the resulting function.

**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, and solve practice problems.

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

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

**Differentiation:** Students will work at the board, go over and correct homework at their seats, actively engage in lecture over new concepts, practice review problems.

## Review Assignment:

p.174 #9,13,15,19,21,25,27,  
31,33,41,43,47,57,65,67



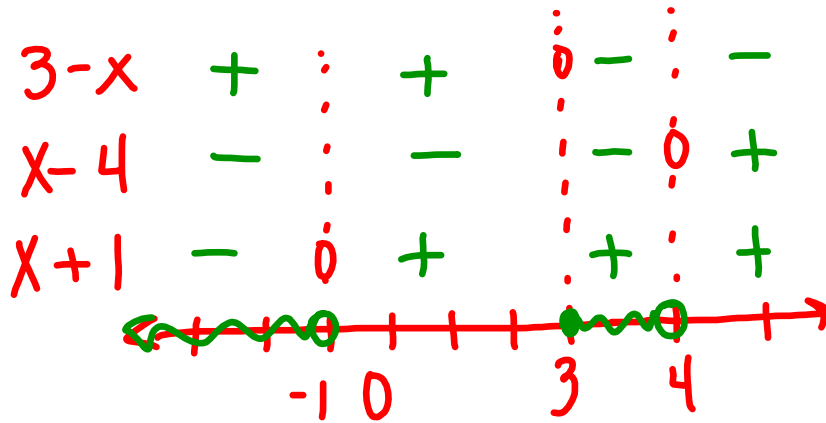
\* go over any questions in your groups \*

\* TEST Friday \*



Find the domain.

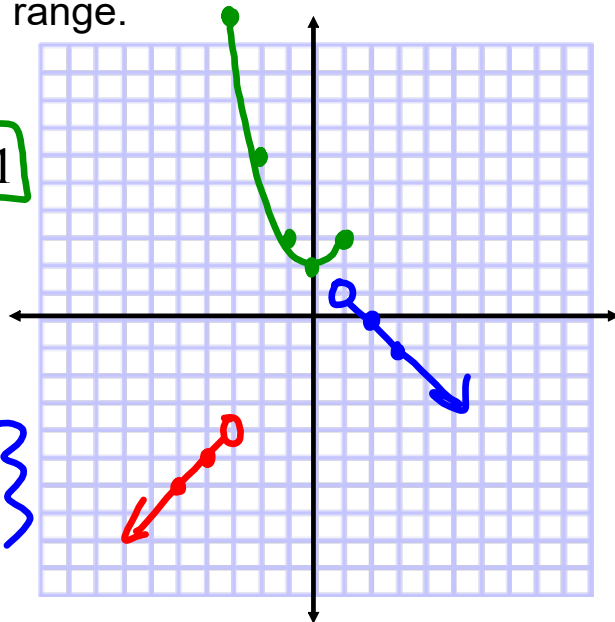
$$f(x) = \sqrt{\frac{3-x}{x^2-3x-4}} \quad \frac{3-x}{(x-4)(x+1)} \geq 0$$



$$D: \{x \mid x < -1, 3 \leq x < 4\}$$

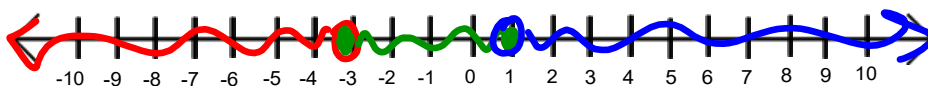
Graph and find the domain and range.

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



$$D: \mathbb{R}$$

$$R: \{y \mid y < 1, 2 \leq y \leq 11\}$$



Find each of the following and the domain:

$$f(x) = \frac{x}{x+3}$$

$$g(x) = \frac{2}{x} \quad \mathcal{D}_g: \{x \mid x \neq 0\}$$

$$\begin{aligned} a) (f \circ g)(x) &= \frac{\frac{2}{x}}{\frac{2}{x} + 3} \\ &= \frac{\frac{2}{x}}{\frac{2 + 3x}{x}} \\ &= \frac{\frac{2}{x}}{\frac{3x+2}{x}} \\ &= \frac{2}{x} \cdot \frac{x}{3x+2} \end{aligned}$$

$$(f \circ g)(x) = \frac{2}{3x+2} \quad \mathcal{D}: \{x \mid x \neq -\frac{2}{3}, 0\}$$

Find each of the following and the domain:

$$f(x) = \frac{x}{x+3}$$

$$g(x) = \frac{2}{x} \quad \mathcal{D}_f: \{x \mid x \neq -3\}$$

$$\begin{aligned} b) (g \circ f)(x) &= \frac{2}{\frac{x}{x+3}} \\ &= 2 \cdot \frac{x+3}{x} \end{aligned}$$

$$(g \circ f)(x) = \frac{2x+6}{x}$$

$$\mathcal{D}: \{x \mid x \neq -3, 0\}$$

Find each of the following and the domain:

$$f(x) = \frac{x}{x+3} \quad g(x) = \frac{2}{x}$$

$$c) (f \circ f)(x) = \frac{\frac{x}{x+3}}{\frac{x}{x+3} + 3} \quad \mathcal{D}: \{x \mid x \neq -3\}$$

$$= \frac{\frac{x}{x+3}}{\frac{x}{x+3} + \frac{3x+9}{x+3}}$$

$$= \frac{\frac{x}{x+3}}{\frac{x + 3x + 9}{x+3}}$$

$$= \frac{\frac{x}{x+3}}{\frac{4x+9}{x+3}}$$

$$= \frac{x}{4x+9}$$

$$= \frac{x}{4x+9}$$

$$(f \circ f)(x) = \frac{x}{4x+9}$$

$$\mathcal{D}: \{x \mid x \neq -3, -\frac{9}{4}\}$$

Even/Odd/Neither? Why?

$$f(x) = \frac{x^3 - x}{1 + x^2}$$

$$-1 \cdot \frac{x^3 - x}{1 + x^2} = \frac{-x^3 + x}{1 + x^2}$$

$$f(-x) = \frac{(-x)^3 - (-x)}{1 + (-x)^2}$$

$$= \frac{-x^3 + x}{1 + x^2}$$

$$f(-x) = \frac{-x^3 + x}{1 + x^2}$$

$\therefore$  odd

$$f(-x) = -f(x)$$

$$= \frac{-x^3 + x}{1 + x^2}$$

Find the AROC between "c" seconds and 2 seconds when:

$$f(x) = 3x^2 - 2x \text{ feet}$$

$$\text{AROC} = \frac{f(c) - f(2)}{c - 2}$$

$$= \frac{3c^2 - 2c - 8}{c - 2}$$

$$= \frac{(3c + 4)(\cancel{c - 2})}{\cancel{c - 2}}$$

$$\text{AROC} = 3c + 4 \text{ ft/s}$$

$$f(2) = 3(2)^2 - 2(2) = 12 - 4$$

$$f(2) = 8$$

$$4 \overset{24}{-6} = 2$$

$$3c^2 + 4c - 6c - 8$$

$$c(3c + 4) - 2(3c + 4)$$

$$(3c + 4)(c - 2)$$

Find each of the following and the domain:

$$f(x) = \frac{2x + 3}{x - 4} \quad \text{D}_f: \{x \mid x \neq 4\} \quad g(x) = \frac{4x}{x - 4} \quad \text{D}_g: \{x \mid x \neq 4\}$$

$$a) (f + g)(x) = \frac{2x + 3}{x - 4} + \frac{4x}{x - 4}$$

$$(f + g)(x) = \frac{6x + 3}{x - 4}$$

$$D: \{x \mid x \neq 4\}$$

Find each of the following and the domain:

$$f(x) = \frac{2x+3}{x-4} \qquad g(x) = \frac{4x}{x-4}$$

$$c) (fg)(x) = \frac{2x+3}{x-4} \cdot \frac{4x}{x-4}$$

$$(fg)(x) = \frac{8x^2+12x}{x^2-8x+16}$$

$$D: \{x \mid x \neq 4\}$$

Find each of the following and the domain:

$$f(x) = \frac{2x+3}{x-4} \qquad g(x) = \frac{4x}{x-4}$$

$$d) \left( \frac{f}{g} \right)(x) = \frac{\frac{2x+3}{x-4}}{\frac{4x}{x-4}}$$

$$= \frac{2x+3}{\cancel{x-4}} \cdot \frac{\cancel{x-4}}{4x}$$

$$\left( \frac{f}{g} \right)(x) = \frac{2x+3}{4x}$$

$$D: \{x \mid x \neq 0, 4\}$$

Graph and find domain and range:

$$f(x) = -4\sqrt{-\frac{1}{2}x+1} + 3$$

parent:  $f(x) = \sqrt{x}$

1)  $f(x) = -\sqrt{x}$   $r_x$

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

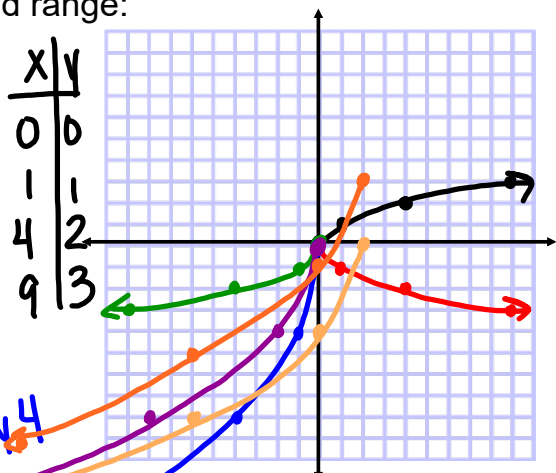
3)  $f(x) = -4\sqrt{x}$  v.s. b.v. 4

4)  $f(x) = -4\sqrt{-\frac{1}{2}x}$  h.s. b.v. 2

5)  $f(x) = -4\sqrt{-\frac{1}{2}(x-2)}$  shift right 2

6)  $f(x) = -4\sqrt{-\frac{1}{2}x+1} + 3$  shift up 3

D:  $\{x | x \leq 2\}$   
R:  $\{y | y \leq 3\}$



Find each of the following and the domain:

$$f(x) = \frac{2x+3}{x-4}$$

$$g(x) = \frac{4x}{x+5}$$

D<sub>f</sub>:  $\{x | x \neq 4\}$

D<sub>g</sub>:  $\{x | x \neq -5\}$

$$(f-g)(x) = \frac{2x+3}{x-4} - \frac{4x}{x+5}$$

$$= \frac{2x^2+13x+15}{(x-4)(x+5)} + \frac{-4x^2+16x}{(x-4)(x+5)}$$

$$(f-g)(x) = \frac{-2x^2+29x+15}{x^2+x-20}$$

D<sub>f-g</sub>:  $\{x | x \neq -5, 4\}$

# Review Assignment:

Eduastic Review on Functions (10 points)

\* will be graded for accuracy \*

\* TEST Friday \*