

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.

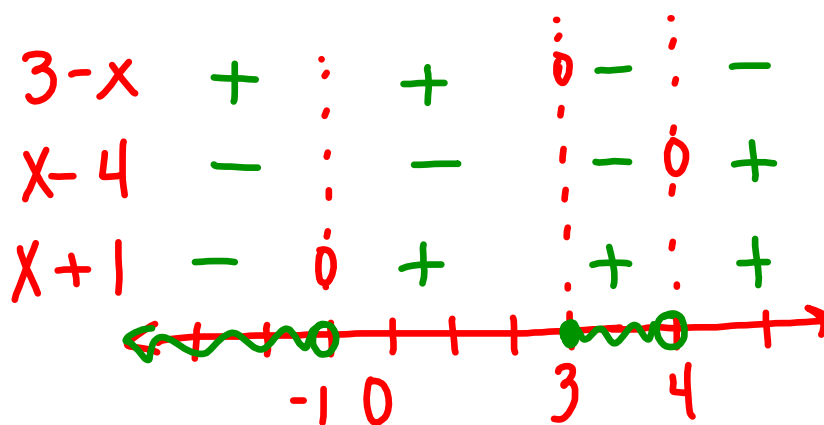
Assessment: Board work, homework check and review assignment

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.

Find the domain.

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

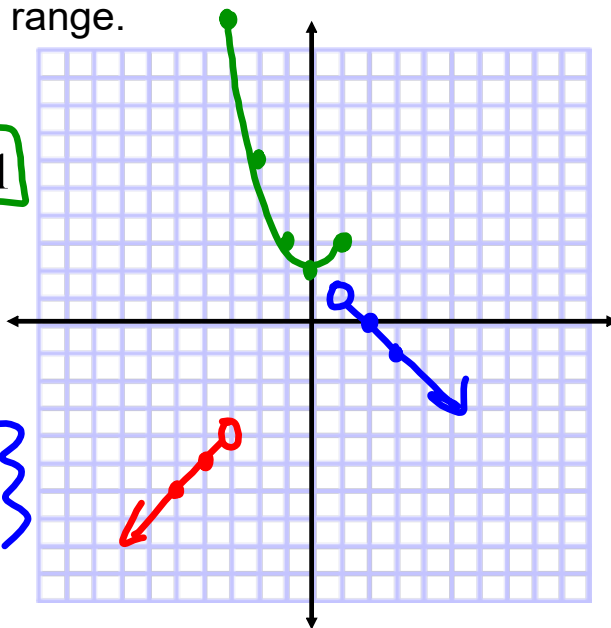
$$\frac{3-x}{(x-4)(x+1)} \geq 0$$



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

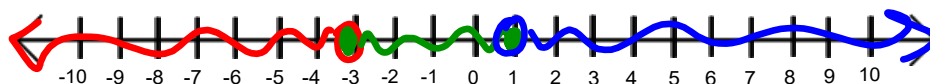
Graph and find the domain and range.

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



$$D: \mathbb{R}$$

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



Find each of the following and the domain:

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

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

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

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

Find each of the following and the domain:

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

$$g(x) = \frac{2}{x}$$

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

$$= 2 \cdot \frac{x+3}{x}$$

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

$$D_f: \{x \mid x \neq -3\}$$

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

Find each of the following and the domain:

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

$$g(x) = \frac{2}{x}$$

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

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

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

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

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

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

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

Even/Odd/Neither? Why?

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

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

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

$$- \frac{3}{4} = -\frac{3}{4} = \frac{3}{-4}$$

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

∴ odd

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

$$-\frac{3}{-4} = \frac{3}{4}$$

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

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

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

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

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

$$\text{AROC} = 3c + 4 \text{ ft} / \cancel{2c}$$

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

$$= 12 - 4$$

$$f(2) = 8$$

$$\overset{24}{4 \cdot 6} = 24$$

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

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

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

Find each of the following and the domain:

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

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

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

$$\mathcal{D}: \{x | x \neq 4\}$$

Find each of the following and the domain:

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

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

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

$$\mathcal{D}: \{x | x \neq 4\}$$

Find each of the following and the domain:

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

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

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

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

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

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. $b_v 4$

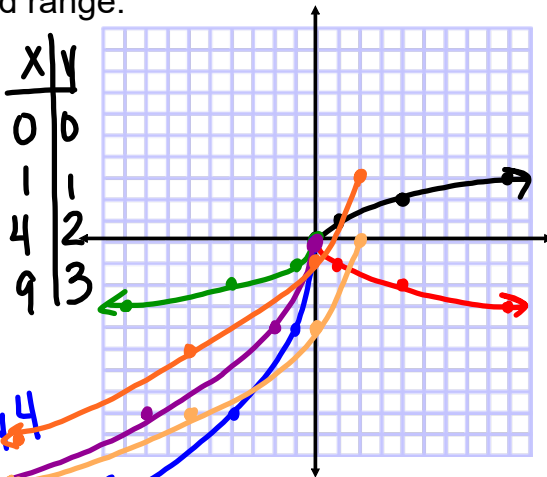
4) $f(x) = -4\sqrt{-\frac{1}{2}x}$ h.s. $b_y 2$

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

$$D: \{x \mid x \leq 2\}$$

$$R: \{y \mid y \leq 3\}$$



Find each of the following and the domain:

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

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

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

$$D_g: \{x \mid x \neq -5\}$$

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

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

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

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

Review Assignment:

Edulastic Review on Functions (10 points)

* will be graded for accuracy *

* TEST Monday *