

## Today's Plan:

**Learning Target (standard):** I will use the definition of function to evaluate functions & find the domain and range of them.

**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.

p.381 #2-34 even

$$2) f(1) = 3$$

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

$$6) f(w) = 3w^2$$

$$8) g(1) = 1$$

$$10) g(-1) = 3$$

$$12) g(s) = s^2 - s + 1$$

$$14) f(3) = 9$$

$$16) f(3+h) = 4h+9$$

$$18) f(-1+h) - f(-1) = 4h$$

$$20) g(-3) = 8$$

$$22) g(2+h) = h^2 + 4h + 3$$

$$24) g(-1+h) - g(-1) = h^2 - 2h$$

$$26) f(3) - g(3) = 18$$

$$28) f(1) + g(1) = 0$$

$$30) f(2+h) - f(2) = 2h^2 + 8h$$

$$32) \frac{g(-2+h) - g(-2)}{h} = -2$$

$$34) \frac{f(-1+h) - f(-1)}{h} = 2h - 4$$

Evaluate.

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

①  $f(-2) = -(-2)^2 + 2(-2) - 3$   
 $= -4 - 4 - 3$   
 $f(-2) = -11$

②  $f(-3a) = -(-3a)^2 + 2(-3a) - 3$   
 $f(-3a) = -9a^2 - 6a - 3$

③  $f(a+h) = -(a+h)^2 + 2(a+h) - 3$   
 $= -(a+h)(a+h) + 2a + 2h - 3$   
 $= -(a^2 + ah + ah + h^2) + 2a + 2h - 3$   
 $= -a^2 - \underline{ah} - \underline{ah} - h^2 + 2a + 2h - 3$   
 $f(a+h) = -a^2 + 2a - 2ah - h^2 + 2h - 3$

①  $f(-2) =$   
 ②  $f(-3a) =$   
 ③  $f(a+h) =$

Evaluate.

$$f(x) = -2x^2 + 3x + 1$$

①  $f(-1) = -2(-1)^2 + 3(-1) + 1$   
 $= -2 - 3 + 1$   
 $f(-1) = -4$

②  $f(3+h) = -2(3+h)^2 + 3(3+h) + 1$   
 $= -2(3+h)(3+h) + 9 + 3h + 1$

③  $f(a+h) = -2(a+h)^2 + 3(a+h) + 1$   
 $= -2(a+h)(a+h) + 3a + 3h + 1$   
 $= -2(a^2 + 2ah + h^2) + 3a + 3h + 1$   
 $= -2a^2 - 4ah - 2h^2 + 3a + 3h + 1$

$f(3+h) = -2h^2 - 9h - 8$

$f(a) = -2a^2 + 3a + 1$

$f(a+h) - f(a) = \frac{-2a^2 + 3a - 4ah - 2h^2 + 3h + 1 - (-2a^2 + 3a + 1)}{h}$   
 $= \frac{-4ah - 2h^2 + 3h}{h}$   
 $\frac{f(a+h) - f(a)}{h} = -4a - 2h + 3$

## Functions and Their Properties:

The basic concept of a function is a set of ordered pairs, and these can also be represented by an equation.

- The **domain** of a function is the set of **x-values** that can be substituted into the function producing real values
- The domain of a function will have exclusions in two different places:
  - those numbers for which the denominator of the function is zero
  - those numbers for which the value of the function is not a real number - square roots of negative numbers
- If there are no exclusions from the domain of a function, the domain will be the set of real numbers

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

exclusions: none

$$D: \mathbb{R}$$

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

exclusions:  $x = -4$

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

## Functions and Their Properties:

- The **range** of a function is the set of **y-values** that can be produced by substituting the values of the domain into the function
- We find the range of a function by substituting numbers into the function and by graphing the function