

WELCOME TO AFM!!!

$$y = 2x$$

Unit 1 Functions

$$f(x) = 2x$$

BIG IDEA: Functions are often used throughout the business world. Some of the uses for functions are to analyze costs, predict sales, calculate profit, forecast future costs and revenue, estimate depreciation, and determine the proper labor force.

Types of numbers:

N
Natural
Numbers

✓
Z
Integers

✓
Q
Rational
Numbers

R
Real
Numbers

I
Imaginary
Numbers

C
Complex
Numbers

1, 2, 3, ...
 $\frac{1}{2}, \frac{1}{3}$

ORDER OF OPERATIONS

Order of Operations

- ① **P**arentheses
- ② **E**xponents
- ③ **M**ultiplication
- Left to Right { ④ **D**ivision
- ⑤ **A**ddition
- Left to Right { ⑥ **S**ubtraction

Ex 1). Simplify: $7 + (6 \times 5^2 + 3)$

$$7 + (6 \cdot 25 + 3)$$

$$7 + (150 + 3)$$

$$7 + 153 = \boxed{160}$$

Ex 2). Simplify: $p - 2 + qp$; use $p = 7$, and $q = 4$

$$p - 2 + q \cdot p$$

$$7 - 2 + 4(7)$$

$$7 - 2 + 28$$

$$\boxed{33}$$

WARM UP:

- 1. Grab a student information sheet.
*** Due Tuesday!**

QUESTIONS ABOUT PEMDAS???

*** Focus problems: 19, 23.

$$23) x - (x - (x - y^3)) ; x = 9, y = 1$$

$$9 - (9 - (9 - 1^3))$$

$$9 - (9 - (9 - 1))$$

$$9 - (9 - 8)$$

$$9 - 1$$

$$\textcircled{8}$$

BOX & FOIL PRACTICE (multiplying polynomials):

*** You have 10 minutes to complete as many problems from the envelope as possible. Use markers on your desk and your partner!

$$\begin{aligned} & (2x-7)(5x+3) \\ & = (10x^2) + (6x) + (-35x) + (-21) \\ & \quad \text{F} \quad \text{O} \quad \text{I} \quad \text{L} \\ & = 10x^2 + 6x - 35x - 21 \\ & = 10x^2 - 29x - 21 \end{aligned}$$

$$\begin{aligned} & (x+20)(x+12) \\ & \begin{array}{r|cc} & x & +20 \\ \hline x & x^2 & 20x \\ +12 & 12x & 240 \end{array} \\ & x^2 + 12x + 20x + 240 \end{aligned}$$

Evaluating Functions

$$\text{Given } f(x) = 3x^2 + 4x - 3$$

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

$$f(5a) = 3(5a)^2 + 4(5a) - 3 = 75a^2 + 20a - 3$$

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

$$= 3(a+2)(a+2) + 4(a+2) - 3$$

$$= 3(a^2 + 4a + 4) + 4a + 8 - 3 = 3a^2 + 16a + 17$$

$$\downarrow a^2 + 2a + 2a + 4$$

$$h(x) = -3x^3 + 7$$

$$h(2)$$

$$h(-5)$$

$$h(4a)$$

$$\text{If } g(x) = \begin{cases} \sqrt{x} + 1 & \text{if } x \leq 4 \\ 3x & \text{if } 4 < x < 10, \text{ find } g(6) \text{ and } g(10). \\ 2x^2 - 15 & \text{if } x \geq 10 \end{cases}$$

$$g(6) = 18$$

$$g(10) = 185$$

Homework:

Find each function value. (Example 4)

30. $g(x) = 2x^2 + 18x - 14$

- a. $g(9)$
- b. $g(3x)$
- c. $g(1 + 5m)$

32. $f(t) = \frac{4t + 11}{3t^2 + 5t + 1}$

- a. $f(-6)$
- b. $f(4t)$
- c. $f(3 - 2a)$

34. $h(x) = 16 - \frac{12}{2x + 3}$

- a. $h(-3)$
- b. $h(6x)$
- c. $h(10 - 2c)$

31. $h(y) = -3y^3 - 6y + 9$

- a. $h(4)$
- b. $h(-2y)$
- c. $h(5b + 3)$

33

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

- a. $g(-2)$
- b. $g(5x)$
- c. $g(8 - 4b)$

35. $f(x) = -7 + \frac{6x + 1}{x}$

- a. $f(5)$
- b. $f(-8x)$
- c. $f(6y + 4)$

