#### What's Going On?

Checking In Homework Logs

Minds on Dinner Party

Action! Adding and Subtracting Polynomials

Consolidation Hey functions, are you equivalent?

Learning Goal - I will be able to determine if a relation is a function from its mapping diagram, graph, table or equation.

### Checking In

# Homework Logs

# Hand 'em in!

#### Unit 2

# **Equivalent Algebraic Expressions**

Lesson 1:

Adding and Subtracting Polynomials

#### Minds on

#### **Dinner Party**

Adam and Mark are hosng a dinner for 400 guests. Cheers banquet hall has quoted these charges:

- \$500, plus \$10 per person, for food
- \$200, plus \$20 per person, for drinks
- A discount of \$5 per person if the number of guests exceeds 200

Adam and Mark have created two different funcons for the total cost, where n represents the number of guests and n > 200

Adam's cost funcon:

$$C_1(n) = (10n + 500) + (20n + 200) - 5n$$

Mark's cost funcon:

$$C_2(n) = (10n + 20n - 5n) + (500 + 200)$$

Are the funcons equivalent?

How do you think Adam and Mark came up with their funcons?

#### Adam's cost funcon:

$$C_1(n) = (10n + 500) + (20n + 200) - 5n$$
  
=  $10_0 + 500 + 20_0 + 200 - 50$   
 $(20n + 200) - 50$ 

#### Mark's cost funcon:

$$C_2(n) = (10n + 20n - 5n) + (500 + 200)$$
  
=  $10n + 20n - 5n + 500 + 200$   
=  $25n + 700$ 

# Are the funcons equivalent?



#### **Equivalent Algebraic Expressions**

Two polynomial functions or algebraic expressions are equivalent if:

- They simplify algebraically to give the same function or expression ANO
- They produce the same graph

Two polynomial functions or algebraic expressions are not equivalent if:

 They result in different values when they are evaluated with the same numbers substituted for the variable(s)

#### Adding and Subtracting Polynomials

Simplify
$$(2x^{2} - 3x + 4) - |(3x^{2} - 4x) + 3(2x^{2} + 5x - 9)$$

$$= 2x^{2} - 3x + 4 - 3x^{2} + 4x + 6x^{2} + 15x - 27$$

$$= 5x^{2} + 16x - 23$$

#### **Equivalent Algebraic Expressions**

$$f(t) = (-5t^2 + 100t + 1000) - (-5t^2 + 75t + 1200)$$

$$f(+) = -5t^2 + 100t + 1000 + 5t^2 - 75t - 1200$$

$$f(+) = 25t - 200$$

$$g(t) = 10t - 200$$

Are f(t) and g(t) equivalent funcons?

Adding and Subtracting Polynomials

$$f(t) = (-5t^2 + 100t + 1000) - (-5t^2 + 75t + 1200)$$

$$g(t) = 10t - 200$$

Are f(t) and g(t) equivalent funcons?

# "Two" methods y and Compare

1. Simplify and Compare

#### Adding and Subtracting Polynomials

$$f(t) = (-5t^2 + 100t + 1000) - (-5t^2 + 75t + 1200)$$

$$g(t) = 10t - 200$$

Are f(t) and g(t) equivalent funcons?

# "Two" methods

#### 2. Substitute numerical values for variable(s)

If you substitute in a particular value and the two functions come out the same, this does NOT mean that they are equivalent.

If you substitute in a particular value and the two functions come out different, this means they are not equivalent.

#### **Equivalent Algebraic Expressions**

Are the expressions xy + xz + yz and  $x^2 + y^2 + z^2$  equivalent?

$$f(x,y,z) = Xy + Xz + yz$$
  
 $g(x,y,z) = X^2 + y^2 + z^2$   
If  $f(x,y,z) \neq g(x,y,z)$  for some  
values  $x, y,z$  then  $f(x,y,z)$  is not  
equivalent to  $g(x,y,z)$   
 $f(1,2,3)$   
 $=(1)(2) + (1)(3) + (2)(3)$   
 $= 2 + 3 + 6$   
 $= 1|$   
 $g(1,2,3)$   
 $=(1)^2 + (2)^2 + (3)^2$   
 $= 1 + 4 + 9$   
 $= 14$   
Because  $f(1,2,3) \neq g(1,2,3)$ ,  $f \neq g(1,2,3)$ ,  $f \neq g(1,2,3)$   
are not equivalent.

#### Consolidation

Hey functions, are you equivalent?

Are the given functions equivalent?

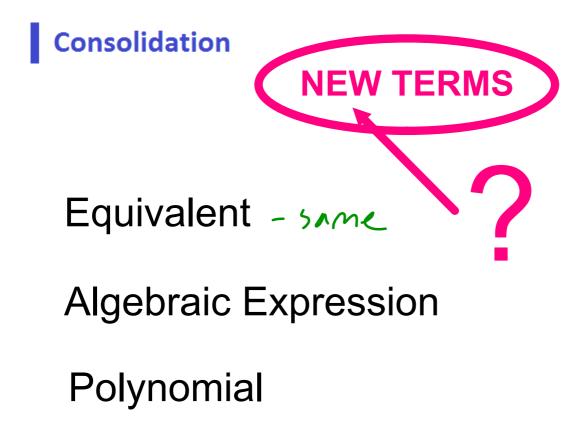
$$f(x) = (2x - 1) + (x - 2) - (x - 3)$$

$$= 2x - 1 + x - 2 - x + 3$$

$$= 2x + 0$$
and
$$g(x) = (3x - 2) - (2x + 3) - (-x - 1)$$

$$= 3x - 2 - 2x - 3 + x + 1$$

$$= 2x - 4$$
The functions are not equivalent.



#### Consolidation

# Homework!

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