

What's Going On?

Checking In

Homework Logs

Minds on

Distribute, FOIL and ...?

Action!

Multiplying Polynomials

Consolidation

Hey functions, are you equivalent?

Learning Goal - I will be able to multiply polynomials and identify equivalent algebraic expressions.

Checking In

F.F.M.

Put this in your grid books from last time.

PREVIOUS Learning Goal - I will be able to simplify algebraic expressions and identify equivalent expressions.

Determine whether the given functions are equivalent:

$$f(x) = x(5 - x) - 2(2x - x^2)$$

$$g(x) = 4x^2(x - 1) - 3x^2 + 5x$$

Pg. 89 #8f

$$\begin{aligned}
 f(x) &= x(5 - x) - 2(2x - x^2) \\
 &= 5x - x^2 - 4x + 2x^2 \\
 &= x^2 + x
 \end{aligned}$$

$$\begin{aligned}
 g(x) &= 4x^2(x - 1) - 3x^2 + 5x \\
 &= 4x^3 - 4x^2 - 3x^2 + 5x \\
 &= 4x^3 - 7x^2 + 5x
 \end{aligned}$$

They are not equivalent!

Checking In

Homework Logs

This time around, instead of writing in "All, Most, Some", please identify the questions that you did.

Example: 1, 4, 8, 10

Checking In

Recapping Last Time

To determine if two functions / expressions are equivalent:

- simplify them algebraically

If they both simplify to the same expression, they're equivalent

- substitute the same value(s) for the variable(s) into each function / expression.

If, for any value, the resulting value is different they are not equivalent

***this method will NEVER tell you that two function / expressions ARE equivalent!**

Minds on

Everything You Ever Wanted to Know About Multiplication

NEW TERM

The commutative property of multiplication says that the order in which you multiply two numbers does not matter!

$$a \times b = b \times a$$

NEW TERM

The distributive property says that when a polynomial is expanded, each of its terms is multiplied by the term outside of the brackets.

$$a(x+y) = ax + ay$$

NEW TERM

The associative property of multiplication says that the way you group terms when multiplying does not matter.

$$(a \times b) \times c = a \times (b \times c)$$

Minds on

Distribute, FOIL and ...

Simplify.

$$2x(x - 3)$$

$$(x - 5)^2$$

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

$$(x - 2)(x^2 - 3x + 7)$$

Minds on

Distribute, FOIL and ...

Simplify.

$$2x(x - 3)$$

$$= 2x^2 - 6x$$

Distributive Property!

Minds on

Distribute, FOIL and ...

Simplify.

$$(x - 5)^2$$

$$= (x - 5)(x - 5)$$

$$= x^2 - 5x - 5x + 25$$

$$= x^2 - 10x + 25$$

FOIL!***THIS IS NOT $x^2 - 25$!!!!!!!!!!!!!!!!!!!!**

Minds on

Distribute, FOIL and ...

Simplify. **FOIL**

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

GRID

$3x$	-2
$2x$	$6x^2$
$+1$	$-4x$
	$+3x$
	-2

$$= 6x^2 + 3x - 4x - 2$$

$$= 6x^2 - x - 2$$

Minds on

Distribute, FOIL and ...

Simplify.

$$(x - 2)(x^2 - 3x + 7)$$

$$= x^3 - 3x^2 + 7x - 2x^2 + 6x - 14$$

$$= x^3 - 5x^2 + 13x - 14$$

"SUPER" FOIL?

Nah, just multiply each term in the first polynomial by each term in the second polynomial!

$$(x - 2)(x^2 - 3x + 7)$$

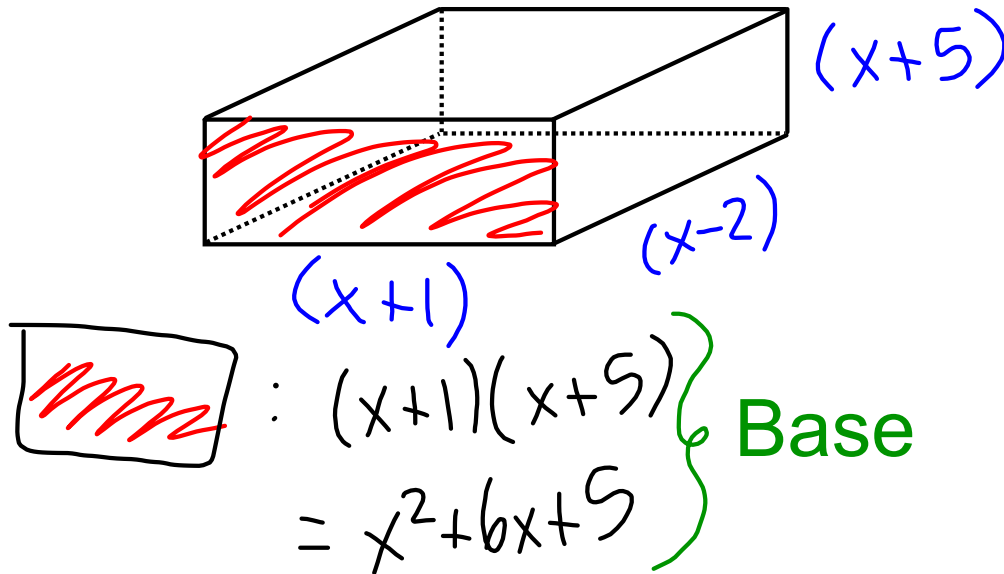
$$= x(\underbrace{x^2 - 3x + 7}) - 2(\underbrace{x^2 - 3x + 7})$$

Instead of "Super Foiling" just break it into two parts.

Action!

Multiplying Polynomials

Example 1: A rectangular prism has length $(x + 1)$, width $(x - 2)$ and a height of $(x + 5)$. Calculate the volume of the shape.

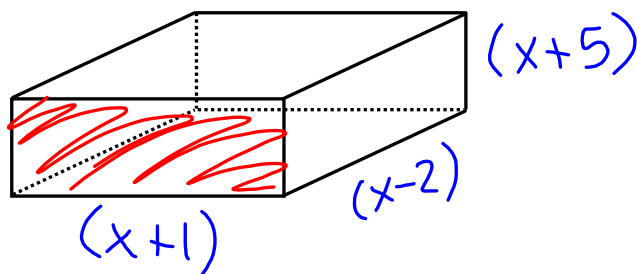


Height

$$\begin{aligned}
 V &= (x-2)(x^2 + 6x + 5) \\
 &= x^3 + \cancel{6x^2} + \cancel{5x} - \cancel{2x^2} - \cancel{12x} - 10 \\
 &= x^3 + 4x^2 - 7x - 10
 \end{aligned}$$

Here, we found the area of the base (the red face) and then multiplied by the height.

Example 1: A rectangular prism has length $(x + 1)$, width $(x - 2)$ and a height of $(x + 5)$. Calculate the volume of the shape.



$$\begin{aligned}
 V &= [(x-2)(x+1)](x+5) \\
 &= (x^2 - x - 2)(x+5) \\
 &= (x+5)(x^2 - x - 2) \\
 &= x^3 - x^2 - 2x + 5x^2 \\
 &\quad - 5x - 10 \\
 &= x^3 + 4x^2 - 7x - 10
 \end{aligned}$$

Just multiply all the sides together.

Action!

Are They Equivalent?

Example 2: Is $(2x + 3y + 4z)^2 = 4x^2 + 9y^2 + 16z^2$?

$$(2x + 3y + 4z)(2x + 3y + 4z)$$

$$= 2x(2x + 3y + 4z) + 3y(2x + 3y + 4z) + 4z(2x + 3y + 4z)$$

$$= 4x^2 + \underbrace{6xy} + \overbrace{8xz} + \underbrace{6xy} + 9y^2 + \underbrace{12yz} + \overbrace{8xz} + \underbrace{12yz} + 16z^2$$

$$= 4x^2 + 12xy + 16xz + 9y^2 + 24yz + 16z^2$$

Consolidation

Hey functions, are you equivalent?

Are the given functions equivalent?

$$f(x) = (2x + 3y + 4z)^2$$

and

$$g(x) = 4x^2 + 9y^2 + 16z^2$$

N O P E

See previous slide

Consolidation

Homework!

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