

11-05-18

Aim: SWBAT use the Distributive Property to multiply polynomials.

HW: Packet Page 20

Quiz Friday (Multiplying Binomials)

Do Now: Packet Page 17

HOMEWORK - Multiplying Polynomials

Simplify. Write your answer in standard form.

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

2) $3x(x + 7)$
 $3x^2 + 21x$

3) $2c(c - 3d)$
 $2c^2 - 6cd$

4) $x^2y(x^3 - y)$
 $x^5y - x^2y^2$

5) $-8mn(14m - 8n + 3)$
 $-112m^2n + 64mn^2 - 24mn$

6) $x^3z^2(z^2 - 5)$
 $x^3z^4 - 5x^3z^2$

7) $xa^4(x^2a - 8c)$
 $x^3a^5 - 8xa^4c$
 $a^5x^3 - 8a^4cx$

8) $4x^2y(2x^3y + 15z - 7)$
 $8x^5y^2 + 60x^2yz - 28x^2y$

9) $3x^3(y^2 + 2x + z)$
 $3x^3y^2 + 6x^4 + 3x^3z$

10) $(5x^3)^2$
 $25x^6$

11) $(-3y^4)^3$
 $-27y^{12}$

12) $(5mn^3)^2$
 $25m^2n^6$

13) Fill in the blank with the correct number.

A. $(x^3y^2)^2 = x^{\underline{6}}y^4$

B. $(2m^4)^{\underline{4}} = 16x^{16}$

C. $3x^{\underline{3}}(x^3 - 5) = 3x^6 - 15x^{\underline{3}}$

14) George has a rectangular garden measuring $(2x)$ feet by $(5x - 2)$ feet. Find the area AND perimeter of the garden.

Area
 $A = lw$

$A = 2x(5x - 2)$
 $A = 10x^2 - 4x$

Perimeter

$P = 2l + 2w$
 $P = 2(2x) + 2(5x - 2)$
 $P = 4x + 10x - 4$
 $P = 14x - 4$

The area is $10x^2 - 4x$ feet²

The perimeter is $14x - 4$ feet

15) Peter found that one side of a greeting card measured $4x$ and another side measured $2x + 3$. Find the area of the greeting card.

$A = lw$
 $A = 4x(2x + 3)$
 $A = 8x^2 + 12x$

The area is $8x^2 + 12x$ units²

AIM: SWBAT use the Distributive Property to multiply polynomials.

DO NOW:

Simplify each expression.

1) $5(9x - 8)$

$45x - 40$

2) $2x(-9x^2 - 2x)$

$-18x^3 - 4x^2$

3) $4y^2(3y^3 - 4y + 5)$

$12y^5 - 16y^3 + 20y^2$

4) $6a^2b^3(5ab - 4b^5)$

$30a^3b^4 - 24a^2b^8$

5) $4x^2 - 2(x^2 - 8x + 9) - 8$

$4x^2 - 2x^2 + 16x - 18 - 8$
 $2x^2 + 16x - 26$

Multiplying Binomials

To multiply a monomial by a polynomial, we use the **Distributive** Property.

-This property can also be used to multiply binomials.

-Remember, an expression is fully simplified when there are no parentheses and no like terms.

Example 1:

$(x + 3)(x + 2)$
 $x^2 + 2x + 3x + 6$
 $x^2 + 5x + 6$

Example 2:

$(x + 4)(x - 5)$
 $x^2 - 5x + 4x - 20$
 $x^2 - x - 20$

What acronym can be used to help us remember how to multiply binomials?

- First terms
- Outer terms
- Inner terms
- Last terms

Another way to multiply binomials is by using a chart:

$$(x + 5)(x + 2)$$

	x	$+5$
x	x^2	$5x$
$+2$	$2x$	10

$$x^2 + 7x + 10$$

$$(x - 3)(x + 3)$$

	x	-3
x	x^2	$-3x$
$+3$	$3x$	-9

$$x^2 - 9$$

Multiply the binomials.

1) $(y - 6)(y + 7)$

2) $(x - 7)(x - 2)$

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

$$6x^2 + 12x - 4x - 8$$

$$6x^2 + 8x - 8$$

4) $(x + 4)(x + 4)$

$$x^2 + 4x + 4x + 16$$

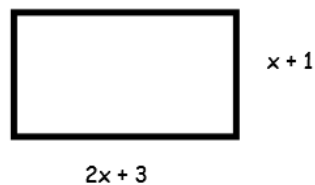
$$x^2 + 8x + 16$$

*5) $(x + 2)(x^2 + 3x + 1)$

$$x^3 + 3x^2 + x + 2x^2 + 6x + 2$$

$$x^3 + 5x^2 + 7x + 2$$

6) Find the area:



$$A = lw$$

$$A = (x + 1)(2x + 3)$$

$$A = 2x^2 + 3x + 2x + 3$$

$$A = 2x^2 + 5x + 3 \text{ units}^2$$

Extra Practice - Multiplying Binomials

Multiply the binomials.

1) $(x - 1)(x - 5)$

2) $(x + 6)(x + 4)$

3) $(x - 9)(x + 9)$
 $x^2 + 9x - 9x - 81$
 $x^2 - 81$

4) $(x - 8)(x + 8)$

5) $(x + 12)(x + 2)$

6) $(x - 7)(x - 5)$

7) $(x + 11)(x + 5)$

8) $(x - 6)(x - 6)$

9) $(2x - 4)(3x + 2)$
 $6x^2 + 4x - 12x - 8$
 $6x^2 - 8x - 8$

10) $(x - 5)(x + 11) + (x + 10)(x + 9)$
 $[x^2 + 11x - 5x - 55] + [x^2 + 9x + 10x + 90]$
 $x^2 + 6x - 55 + x^2 + 19x + 90$
 $2x^2 + 25x + 35$

Keep signs the same

11) $(3x + 5)(x + 4) + (x - 1)(x + 14)$
 $[3x^2 + 12x + 5x + 20] + [x^2 + 14x - x - 14]$
 $3x^2 + 17x + 20 + x^2 + 13x - 14$
 $4x^2 + 30x + 6$

Extra Practice - Multiplying Binomials

Multiply the binomials.

1) $(x - 1)(x - 5)$

$x^2 - 5x - x + 5$

$x^2 - 6x + 5$

2) $(x + 6)(x + 4)$

$x^2 + 4x + 6x + 24$

$x^2 + 10x + 24$

3) $(x - 9)(x + 9)$

$x^2 + 9x - 9x - 81$

$x^2 - 81$

4) $(x - 8)(x + 8)$

$x^2 + 8x - 8x - 64$

$x^2 - 64$

5) $(x + 12)(x + 2)$

$x^2 + 2x + 12x + 24$

$x^2 + 14x + 24$

6) $(x - 7)(x - 5)$

$x^2 - 5x - 7x + 35$

$x^2 - 12x + 35$

7) $(x + 11)(x + 5)$

$x^2 + 5x + 11x + 55$

$x^2 + 16x + 55$

8) $(x - 6)(x - 6)$

$x^2 - 6x - 6x + 36$

$x^2 - 12x + 36$

9) $(2x - 4)(3x + 2)$

$6x^2 + 4x - 12x - 8$

$6x^2 - 8x - 8$

10) $(x - 5)(x + 11) + (x + 10)(x + 9)$

$[x^2 + 11x - 5x - 55] + [x^2 + 9x + 10x + 90]$

$x^2 + 6x - 55 + x^2 + 19x + 90$

$2x^2 + 25x + 35$

11) $(3x + 5)(x + 4) + (x - 1)(x + 14)$

$[3x^2 + 12x + 5x + 20] + [x^2 + 14x - 1x - 14]$

$3x^2 + 17x + 20 + x^2 + 13x - 14$

$4x^2 + 30x + 6$

HOMEWORK - MULTIPLYING BINOMIALS

Simplify the following expressions by multiplying. Make sure your answer is in standard form.

1) $-7x(2x + 9)$

2) $3s(5s^2 + 2s - 1)$

3) $2x(2x + 5)$

4) $(x + 5)(x + 1)$

5) $(y + 4)(y - 7)$

6) $(x - 10)(x + 3)$

7) $(a - 4)(a - 5)$

8) $(2x + 6)(x - 1)$

9) $(2x + 2)(6x + 1)$

10) $(x + 6)^2$

11) $(x - 6)^2$

12) $(x + 3)(x^2 + 4x + 2)$

13) Describe and correct the error made in finding the product of $(2x - 3)$ and $(x + 7)$

	x	7
$2x$	$2x^2$	$14x$
3	$3x$	21

Answer: $(2x - 3)(x + 7) = 2x^2 + 17x + 21$