Essential Question: How do we multiply polynomials?

Do Now: Simplify each expression.

A) 2x(6x)   B) 3(6x − 4)

C) What properties did you use to simplify the expressions above?

STOP HERE

Multiply a Monomial by a Monomial:

When multiplying monomials, use the ***product rule for exponents***.

$$x^m \bullet x^n = x^{m+n}$$

Multiply coefficients and *add* exponents if bases are the same.

1. $(-4x^2y)(5xy)$ 2. $(6a^4b)(2ab^9)(3a^3)$

Multiply a Monomial by a Polynomial:
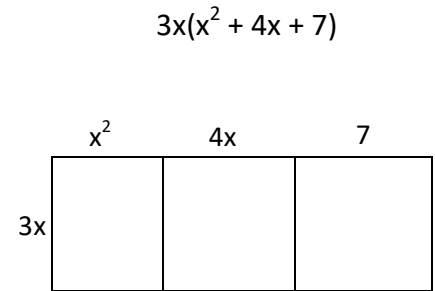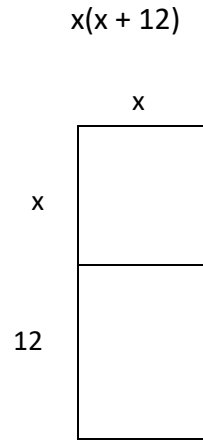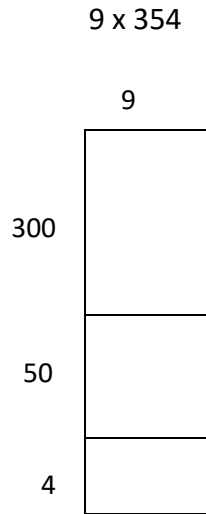
When multiplying a monomial by a polynomial, use the ***distributive property***.

3. 2x(3x + 4)   4. $-4x^2(x^3 + 3x^2 − 1)$

THINK ABOUT THIS....

How can we represent multiplying a monomial by a polynomial with a diagram?

9 x 354

x(x + 12)

$3x(x^2 + 4x + 7)$

Create diagrams in order to multiply the following monomials by polynomials.

5. 2a(7a + 3)

6. $7w(6w^2 + 11w - 2)$

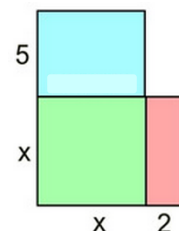7. Which choice is NOT equivalent to: $5x(4x^2 - 2x)$

(a) $20x^3 - 10x^2$

(b) $5x^2(4x - 2)$

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

(d) $10x^2(2x - 1)$

8. The diagram at the right is composed of a square and two rectangles. Write a polynomial expression for the total area of the figure in square units.

Today's Take Away...

We can multiply polynomials by using the _____ property or by creating a

_____.

Add or subtract the polynomials.

1. $2r + (5 + 2r) + r^2$

2. $(5x^2 - 4) + (-3x^2 - 9)$

3. $-\frac{1}{2}y + [7 + (\frac{1}{4}y - 7)]$

4. $(x^3 + 9x - 5) - (-4x^2 - 12x - 5)$

5. $(5x + 3) - (6x - 5) + (9x + 1)$

Multiply each set of polynomials.

6. $(-9z)(8z^4)(z^3)$

7. $4x(5x + 6)$

8. $5s^2(-2s^2 + 3s - 4s^3)$

9. The dimensions of the outer rectangle pictured below are **5x + 8** and **10x**. The dimensions of the inner rectangle are **5x** by **x + 6**.

   a. Express the area of the outer rectangle as a polynomial expression in simplest form.

   b. Express the area of the inner rectangle as a polynomial expression in simplest form.

   c. Express the area of the shaded region as a polynomial expression in simplest form.

   Helpful Hint: Label the diagram.