

Essential Question: How do we multiply polynomials?

Do Now: Simplify each expression.

A) $2x(6x)$

$$2 \cdot 6 \cdot x^1 \cdot x^1$$

$$12x^2$$

B) $3(6x - 4)$

$$3(6x) - 3(4)$$

$$18x - 12$$

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

distributive

STOP HERE

Multiply a Monomial by a Monomial:

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

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

Multiply coefficients and add exponents if bases are the same.

1. $(-4x^2y)(5xy)$

$$-20x^3y^2$$

2. $(6a^4b)(2ab^9)(3a^3)$

$$(6 \cdot 2 \cdot 3) \cdot (a^4 \cdot a^1 \cdot a^3) \cdot (b \cdot b^9)$$

$$36a^8b^{10}$$

Multiply a Monomial by a Polynomial:

When multiplying a monomial by a polynomial, use the **distributive property**.

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

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

$$6x^2 + 8x$$

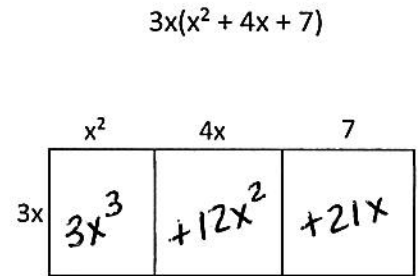
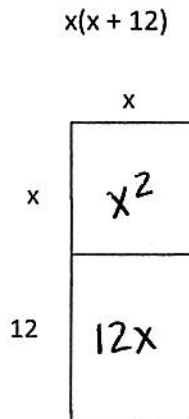
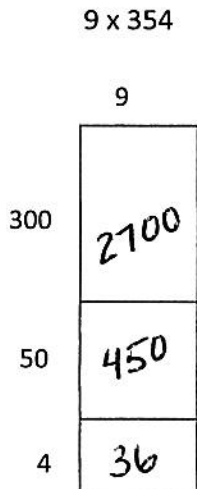
4. $-4x^2(x^3 + 3x^2 - 1)$

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

$$-4x^5 - 12x^4 + 4x^2$$

THINK ABOUT THIS....

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



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

5. $2a(7a + 3)$

$14a^2 + 6a$

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

$42w^3 + 77w^2 - 14w$

7. Which choice is NOT equivalent to: $5x(4x^2 - 2x)$ $20x^3 - 10x^2$

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

(b) $5x^2(4x - 2)$ $20x^3 - 10x^2$

(c) $5x^3(4x - 2)$ $20x^4 - 10x^3$

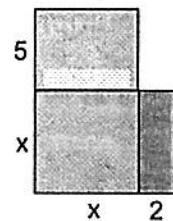
(d) $10x^2(2x - 1)$ $20x^3 - 10x^2$

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.

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

$5x + x^2 + 2x$

$x^2 + 7x$



Today's Take Away...

We can multiply polynomials by using the distributive property or by creating a box diagram.