Pre-Algebra

Essential Question: How do we multiply monomials and polynomials?

Do Now: Write as a single power.

a. $2^3 \cdot 2^3$ 2^6

b. $3^5 \cdot 3^2 \cdot 3^1$ 3^8

c. $x^4 \cdot x^5$ x^9

d. $-7x^4 \cdot 4x^5$ $-28x^9$

Multiplying Monomials

- **Multiply** coefficients.
- **Multiply** variables/powers (add exponents if bases are the same).

1. $3(2x)$ $6x$

2. $4(6x^2)$ $24x^2$

3. $7(2xy)$ $14xy$

4. $(3x^1)(2x^1)$ $6x^2$

5. $(-4x^2)(5x^1)$ $-20x^3$

6. $(9x^3)(3x^2)$ $27x^5$

7. $(x^2y^3)(2x^3y^4)$ $2x^5y^7$

8. $(4x^1y^1)(6x^2)$ $24x^3y$

9. $-4a^1(7a^6b)$ $-28a^2b$

10. $(6a^4b^1)(2a^1b^9)(3a^3)$ $36a^8b^{10}$

11. $(-2x)^3$ $-8x^3$

12. $-(7ab)(4b^2)$ $-28ab^3$

Multiplying Monomials & Polynomials

- **Use the** distributive **property.**
- **Add exponents of like bases.**

13. $2x^1(3x^1 + 4)$ $6x^2 + 8x$

14. $-4x^2(x^3 + 3x^2 - 1)$ $-4x^5 - 12x^4 + 4x^2$

15. $x^2y^1(2x^2y^1 + 9x^1y^1 - 3x^1y^3)$ $2x^4y^2 + 9x^3y^2 - 3x^3y^4$

THINK ABOUT THIS....

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

9 x 354

	9
300	2700
50	450
4	36

3186

x(x + 12)

	x
x	x^2
+12	12x

x^2+12x

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

	x^2	4x	7
3x	$3x^3$	$12x^2$	21x

$3x^3 + 12x^2 + 21x$

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

16. $2a^2(7a - 3)$

	7a	-3
$2a^2$	$14a^3$	$-6a^2$

$14a^3 - 6a^2$

17. $7w(6w^2 + 11w - 2)$

	$6w^2$	+11w	-2
7w	$42w^3$	$77w^2$	-14w

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

Turn and Talk:

For A – C, write down a product of a monomial and polynomial that is equivalent to the expression.

A. $2x^4 + 2x^5 + 2x^{10}$

$2x^4(1 + x + x^6)$

B. $42w^3 - 14w + 77w^5$

$7w(6w^2 - 2 + 11w^4)$

C. $z^2a + z^3b$

$z(za + z^2b)$