

## Lesson 3: Multiplying Polynomials

### Goals:

- Multiply a polynomial by a constant.
- Multiply a polynomial by a monomial.

$$x^a \times x^b = x^{a+b}$$

### Multiplication with Monomials

When we multiply polynomials together, we multiply the coefficients together first, and then we multiply the variables. We need to use the Laws of Exponents that we learned previously when we multiply the variables together.

Remember that  $(x^2)(x^3) = x^5$

### Example 1

Multiply the following polynomials.

a)  $x^3 \cdot x^4$

$$x^{3+4} = x^7$$

b)  $(3m^4)(m^2)$

$$3m^{4+2} = 3m^6$$

c)  $(-2xy^3)(-x^4y^3)$

$$= 2x^5y^6$$

d)  $(4p^2q^7)(-3pq)$

$$-12p^3q^8$$

e)  $(-\frac{1}{3}m^2n^5)(-9m^7n)$

$$= 3m^9n^6$$