



## Ch 9.2

# Multiplying & Factoring

## + Multiplying a Monomial & Trinomial

- Multiply the monomial by each term of the tri.
- Be careful of signs.  $(+)(-) = -$        $(-)(-) = +$
- Remember: Mult. the coefficients and add the exponents w/ same bases.

### Examples:

$$1. 4b(5b^2 + b + 6) = 4b(5b^2) + 4b(b) + 4b(6) = \\ \mathbf{20b^3 + 4b^2 + 24b}$$

$$2. 3y^2(4y^3 + 12y^2 - 5y) = 3y^2(4y^3) + 3y^2(12y^2) + 3y^2(-5y) = \\ \mathbf{12y^5 + 36y^4 - 15y^3}$$

### Try Some:

$$1. -2g^2(3g^3 + 6g - 5) \quad 2. 7x(3x^2 + 8x - 1) \quad 3. 6z^5(-8z^4 + 10z^2 - 3z)$$

## + Finding the Greatest Common Factor

- The GCF is the greatest factor that divides evenly into each term.
- Prime factor each term. Find the factors all terms share. (multiply them together)

\*will never be greater than the smallest # and variable.

Ex.  $3t^2 - 18t$

$$3t^2 = 3 \cdot t \cdot t$$

$$-18t = -1 \cdot 2 \cdot 3 \cdot 3 \cdot t$$

$$\text{GCF: } 3 \cdot t = 3t$$

Ex.  $2c^3 - 8c^2 + 10c$

$$2c^3 = 2 \cdot c \cdot c \cdot c$$

$$-8c^2 = -1 \cdot 2 \cdot 2 \cdot 2 \cdot c \cdot c$$

$$10c = 2 \cdot 5 \cdot c$$

$$\text{GCF: } 2 \cdot c = 2c$$

Try Some:

1.  $5v^5 + 10v^3$

2.  $4b^3 - 2b^2 - 6b$

3.  $2x^4 + 10x^2 - 6x$

## + Factoring Out a Monomial

- Find the GCF then factor (divide) it out of each term
- Remember: Divide the coefficients & subtract the exponents w/ same bases.
- Check the smallest # & variable 1<sup>st</sup> to see if GCF

Ex 1.  $6m^3 - 12m^2 + 15m$       $6m^3 = 2 \cdot 3 \cdot m \cdot m \cdot m$

$$-12m^2 = -1 \cdot 2 \cdot 2 \cdot 3 \cdot m \cdot m$$

$$15m = 3 \cdot 5 \cdot m$$

GCF:  $3 \cdot m = 3m$

$$\frac{6m^3}{3m} - \frac{12m^2}{3m} + \frac{15m}{3m}$$

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

\*Check by distributing

+

Ex 2.  $25p^5 + 15p^4 - 35p^2$

$$25p^5 = 5 \cdot 5 \cdot p \cdot p \cdot p \cdot p \cdot p$$

$$15p^4 = 3 \cdot 5 \cdot p \cdot p \cdot p \cdot p$$

$$-35p^2 = -1 \cdot 5 \cdot 7 \cdot p \cdot p$$

GCF:  $5 \cdot p \cdot p = 5p^2$

$$\frac{25p^5}{5p^2} + \frac{15p^4}{5p^2} - \frac{35p^2}{5p^2}$$

$$5p^2(5p^3 + 3p^2 - 7p)$$

### Try Some:

Factor out the GCF.

1.  $8x^2 - 12x$

2.  $5d^3 + 10d$

3.  $4k^3 - 8k^2 + 12k$

4.  $12x^4 + 24x^2 - 18x$

