

## TOPIC: FACTORING BY GCF

### GCF of Terms

◆ To factor something means to rewrite it as a product of two or more numbers or terms. (e.g.  $10 = \overset{\text{factors}}{\underline{\quad}} \cdot \underline{\quad}$ )

► Given a list of terms, the **Greatest Common Factor (GCF)** is the \_\_\_\_\_ of *all* their common prime factors.

| Recall | GCF of <i>Numbers</i>                                                                                         | New | GCF of <i>Terms</i>                                                                                                                    |
|--------|---------------------------------------------------------------------------------------------------------------|-----|----------------------------------------------------------------------------------------------------------------------------------------|
|        | $9 \quad \& \quad 54$                                                                                         |     | $9t^2 \quad \& \quad 54t$                                                                                                              |
|        | <b>Factored</b> $9 = \underline{\quad} \cdot \underline{\quad}$                                               |     | <b>Factored</b> $9t^2 = \underline{\quad} \cdot \underline{\quad} \cdot \underline{\quad} \cdot \underline{\quad}$                     |
|        | <b>form:</b> $54 = \underline{\quad} \cdot \underline{\quad} \cdot \underline{\quad} \cdot \underline{\quad}$ |     | <b>form:</b> $54t = \underline{\quad} \cdot \underline{\quad} \cdot \underline{\quad} \cdot \underline{\quad} \cdot \underline{\quad}$ |
|        | <b>GCF:</b> $\underline{\quad} \cdot \underline{\quad} =$                                                     |     | <b>GCF:</b> $\underline{\quad} \cdot \underline{\quad} \cdot \underline{\quad} =$                                                      |

### EXAMPLE

Determine the GCF of the following list of terms.

$$12a^2, 30a^3, 42a^5$$

◆ We can also define the GCF as the largest factor that evenly \_\_\_\_\_ out of every term.

## TOPIC: FACTORING BY GCF

### PRACTICE

What is the greatest common factor of the following lists of numbers?

(A)

42, 70, 98

(B)

19, 57

### EXAMPLE

Find the GCF of the list of monomials.

$a^2b, ab^3, a^3b^2$

### PRACTICE

What is the greatest common factor of the following sets of monomials?

(A)

$6x, 9x^2, 15x^3$

(B)

$30m^3n^2, 45m^2n^4, 75m^4n^3$

## TOPIC: FACTORING BY GCF

### Factor GCF Out of Polynomials

◆ Recall: The GCF of a list of terms is the largest factor that evenly divides out of every term.

► Once we find the GCF of the terms in a *polynomial*, we can \_\_\_\_\_ it out.

New

#### Factoring Out the Greatest Common Factor

$$9t^2 - 54t$$

**Identify GCF:**  $9t^2 = 3 \cdot 3 \cdot t \cdot t$   
 $54t = 3 \cdot 3 \cdot 3 \cdot 2 \cdot t$  → **GCF:** \_\_\_\_\_

**Rewrite:**  $= \frac{\quad}{\text{GCF}} ( \quad ) - \frac{\quad}{\text{GCF}} ( \quad )$

**Factor GCF out:**  $= \frac{\quad}{\text{GCF}} ( \quad - \quad )$

**Check answer:**

#### EXAMPLE

Factor out the GCF.

$$6x + 12x^3 - 24x^4$$

## TOPIC: FACTORING BY GCF

### PRACTICE

Factor the GCF out of:

(A)  $8x + 12$

(B)  $6x^2 + 9x$

### EXAMPLE

Factor the GCF from the polynomial.

$$10a^3b + 15a^2b^2 + 25ab^3$$

### PRACTICE

Factor the GCF from the polynomial.

$$18x^3y^2 - 27x^2y^3 + 9x^4y$$

### EXAMPLE

Factor the following.

$$3x(x + 4) - 5(x + 4)$$