

Name: _____

Date: _____

6.4 7.4 GCF Factoring

Greatest Common Factor (GCF):

Largest factor shared by two or more terms

ex. GCF of $12 + 28$ is 4

$12 \rightarrow 1, 2, 3, 4, 6, 12$

$28 \rightarrow 1, 2, 4, 7, 14, 28$

Ex. Determine the GCF of each pair of terms:

$16 \cdot \boxed{x \cdot x} \cdot \boxed{2} / 24 \cdot \boxed{x \cdot x} \cdot \boxed{2} \cdot y \cdot y$

a) $16x^2y$ and $24x^2y^3$

b) $5m^2n$ and $15mn^2$

c) $48ab^3c$ and $36a^2b^2c^2$

$$\text{GCF} = 8x^2y$$

$$\text{GCF} = 5mn$$

$$\text{GCF} = 12ab^2c$$

variable is common

- ★ to all terms
- take the smaller exponent

Recall distribution: $2x(3x^2 - 4) = 6x^3 - 8x$

Factoring is the reverse process: $6x^3 - 8x = 2x(3x^2 - 4)$

To factor means to write as a product.

Ex. Write each polynomial in factored form.

a) $16r^2 - 20r$

$$= \boxed{4r(4r - 5)}$$

$$\frac{\cancel{16}r^2 - \cancel{20}r}{4r}$$

b) $4x^3y^2 - 14x^2$

$$= 2x^2(2xy^2 - 7)$$

$$c) 27r^2s^2 - 18r^3s^2 - 36rs^3$$

$$= 9rs^2(3r - 2r^2 - 4s)$$

$$d) 12n^5p^4 + 8n^4p^3 - 4n^3p^2$$

$$= 4n^3p^2(3n^2p^2 + 2np - 1)$$

Ex. Paula has 18 toonies, 30 loonies, and 48 quarters. She wants to group her money so that each group has the same number of each coin and there are no coins leftover.

a) What is the maximum number of groups she can make?

$$\text{GCF of } 18, 30, 48 \\ = 6$$

b) How many of each coin will be in each group?

$$\frac{18}{6}$$

$$\frac{30}{6}$$

$$\frac{48}{6}$$

$$= 3 \text{ toonies, } 5 \text{ loonies, } 8 \text{ quarters}$$

c) How much money will each group be worth?

$$3 \times 2 = \$6$$

$$5 \times 1 = \$5$$

$$8 \times 0.25 = \$2$$

$$+ \} \$13$$