FMP10 Name: _____
Date: _____

3.4 Common Factors

Greatest Common Factor (GCF):

Largest factor shared by two or more terms.

ex. GCF of $12 + 28 = 4$

12: 1 2 3 4 6 12

28: 1 2 4 7 14 28

Ex. Determine the GCF of each pair of terms:

a) $16x^2y$ and $24x^2y^3$ $\quad x\cdot x\cdot y \quad x\cdot x\cdot y\cdot y\cdot y$

GCF = $8x^2y$

variable common to all terms & smaller exponent

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

GCF = $5mn$

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

GCF = $12ab^2c$

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) $16r^2 - 20r$

$= 4r(4r - 5)$ $\quad \frac{16r^2 - 20r}{4r}$

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

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

Recall double distribution: $(x-3)(2x+y) = x(2x+y) - 3(2x+y)$ Step 1

$= 2x^2 + xy - 6x - 3y$ Step 2

We can reverse step 1 by factoring a binomial factor:

Ex. Factor each polynomial.

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

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

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

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

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

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

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

We can reverse step 2 by group factoring:

Ex. Factor each polynomial.

a) $y^2 + 8xy + 2y + 16x$

$y(y+8x) + 2(y+8x)$

$(y+8x)(y+2)$

b) $a^2 - a + 3ab - 3b$

$a(a-1) + 3b(a-1)$

$(a-1)(a+3b)$

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?

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 toonies, 5 loonies, 8 quarters

c) How much money will each group be worth?

$3 \times 2 = \$6$

$5 \times 1 = \$5$

$8 \times .25 = \$2$

$\$13$

Practice: pg. 220/ 4 – 7, 10 – 14, 16