NOTES: Intro to Factoring

Goals: #1 - I can factor out the GCF of polynomials.







#2 - I can factor 4 terms by grouping.

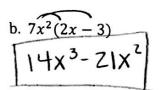
Homework: MORE PRACTICE.

Exploration #1: Work with a partner and answer the following questions.

1. Multiply the following polynomials.

a.
$$3x(3x^2 - 5)$$

 $9x^3 - 15x$



2. Find the greatest common factor (GCF) of the pair of numbers.



Notes:

To multiply polynomials, we ________. We use this same idea to _______ polynomials.

When factoring a polynomial, we $\frac{factor}{}$ out the $\frac{6CF}{}$ of the polynomials.

Example #1: Factor out the greatest common factor.

1.
$$9x^3 - 15x$$

2.
$$14x^3 - 21x^2$$

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3.
$$3n^3 - 32n^2 + 12n$$

$$3n(n^2 - 11n + 4)$$

$$\frac{4.8y^3 - 2y}{2y(4y^2 - 1)}$$

You practice: Factor out the greatest common factor.

1.
$$4y^3 - 10y^2$$

2.
$$9x^3 + 6x^2 + 18x$$

Notes:

When we see 4 terms in the polynomial, we factor by grouping

EXAMPLE: Factor the polynomial by grouping.

$$\frac{x^{3}-2x^{2}}{(x-2)-9(x-2)}$$

$$\frac{(x-2)(x^{2}-9)}{(x^{2}-9)}$$

Example #1: Factor the polynomial by grouping.

1.
$$2x^3 - 8x^2 + 3x - 12$$

$$2x^{2}(x-4)+3(x-4)$$

$$(x-4)(2x^2+3)$$

2.
$$10x^2 - 15x + 2x - 3$$

$$(2x-3)(5x+1)$$

You practice: Factor the polynomial by grouping.

1.
$$2x^3 - 3x^2 - 4x + 6$$

$$X^{2}(2x-3)-2(2x-3)$$

$$(2x-3)(x^2-2)$$

$$2. \ 10x^2 - 7x - 10x + 7$$

$$\times (10x-7)-1(10x-7)$$

$$(10x-7)(x-1)$$

MORE PRACTICE:

1. Factor out the greatest common factor.

a.
$$2x+2$$

$$2(X+1)$$

c.
$$3s^4 + 16s$$

$$S(3s^3 + 16)$$

e.
$$7w^5 - 35w^2$$

g.
$$8x^3y^2 - 16x^4y$$

2. Factor by grouping.

a.
$$x^3 + x^2 + 2x + 2$$

 $x^2(x+1) + 2(x+1)$
 $(x+1)(x^2+2)$

c.
$$z^3 - 4z^2 + 3z - 12$$

 $z^2(z-4) + 3(z-4)$
 $(z-4)(z^2+3)$

e.
$$4y^3 - 7y^2 - 16y + 28$$

 $y^2 (4y - 7) - 4(4y - 7)$
 $(4y - 7)(y^2 - 4)$

b. $6x^2 - 15x$ 3x (2x-5)

d.
$$5d^{6} - 2d^{2}$$

f.
$$12a^5 - 8a$$
 $4a(3a^4 - 2)$

h.
$$18x^2y - 4x^3y$$

$$2x^2y (9 - 2x)$$

b.
$$a^{3} + 13a^{2} - 5a - 65$$

 $a^{2}(a + 13) - 5(a + 13)$
 $a^{2}(a + 13)(a^{2} - 5)$

$$\frac{d \cdot 5d^{6} - 2d^{2}}{\left[d^{2} \left(5d^{4} - 2\right)\right]}$$

f.
$$m^3 - 3m^2 - 4m + 12$$

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