Warm Up 4/25/19

1. Simplify: $(3x - 4)^2$

$(3x-4)(3x-4)$

	$3x$	-4
$3x$	$9x^2$	$-12x$
-4	$-12x$	16

$\boxed{9x^2-24x+16}$

2. Simplify: $(3x^2)^2$ $=\boxed{9x^4}$

3. The sum of three consecutive even integers is 144. Find the sum of the smaller two integers.

+ =

x 46
$x+2$ 48
$x+4$ 50

$x+x+2+x+4=144$

$3x+6=144$
$-6 \quad -6$

$\frac{3x}{3}=\frac{138}{3}$

$x=46$

$\boxed{94}$

Directions: Simplify the following polynomials.

- $a(3a+7)$ = $3a^2+7a$
- $-2m(m^2+6m-1)$ = $-2m^3-12m^2+2m$
- $4x^3y(x^2-2y)$ = $4x^5y-8x^3y^2$

$$\frac{3a^2}{a} \quad \frac{7a}{a}$$

What is FACTORING???

$$\frac{4x^2}{2x} - \frac{2x}{2x} \rightarrow 2x(2x-1)$$

Simplest Form → Factored Form

Polynomials that cannot be factored are called PRIME

Factoring a GCF

Steps for Factoring a GCF:

Step 1: Identify the GCF of the polynomial:

- Check the **coefficients** for a GCF.
- Now look at the **variables**. A variable must be present in all terms to be a GCF. If a variable is present in all terms, take the one with the smallest exponent.

Step 2: Divide each term by the **GCF** and leave the remaining factors in parentheses

Step 3: Check your work by distributing!

It's like the opposite of distributing!

EXAMPLES:

$$\frac{3x}{3} + \frac{12}{3}$$

$$3(x+4)$$

$$\frac{8m}{4} + \frac{36n}{4}$$

$$4(2m+9n)$$

$$\frac{6a^2}{3} + \frac{27}{3}$$

$$3(2a^2+9)$$

$$\frac{21cd}{3d} - \frac{3d}{3d}$$

$$3d(7c-1)$$

EXAMPLES:

$$\frac{15a^2b}{15ab} - \frac{30ab}{15ab}$$

$15ab(a-2)$

$ab - a$

$a(b-1)$

$5x - 13y$

PRIME

$$\frac{2x^2y}{2xy} - \frac{2xy^2}{2xy} + \frac{4xy}{2xy}$$

$2xy(x-y+2)$

EXAMPLES:

$6y^4 + 14y^3 - 10y^2$

$14gh^2 + 28gh + 14h$

$m^3n - m^2n^2 + 5mn^3$

$35a^2 - 20ab^2 + 15a$

4 Terms

Factor by GROUPING

Steps	Example
Step 1: Group the first two terms together and the last two terms together.	$(\frac{x^3}{x^2} + \frac{7x^2}{x^2})(+\frac{2x}{2} + \frac{14}{2})$
Step 2: Factor out the GCF from each binomial.	$x^2(x+7)2(x+7)$
Step 3: Factor the common binomial out.	$\boxed{(x^2+2)(x+7)}$
Step 4: Distribute to check your answer.	$x^3+7x^2+2x+14$

Examples:

$$\left(\frac{x^3}{x^2} + \frac{4x^2}{x^2}\right)\left(+ 8x + 32\right)$$

$$x^2(x+4)\,8(x+4)$$

$$\boxed{(x^2+8)(x+4)}$$

$$\left(w^3 + 5w^2\right)\left(- 8w - 40\right)$$

$$w^2(w+5)\,-8(w+5)$$

$$\boxed{(w^2-8)(w+5)}$$

Examples:

$$(p^5 - 6p^3)(- 2p^2 + 12)$$

$$p^3(p^2-6)-2(p^2-6)$$

$$(p^3-2)(p^2-6)$$

$$(3x^3 - 21x^2)(+ 4x - 28)$$

$$3x^2(x-7)+4(x-7)$$

$$\boxed{(3x^2+4)(x-7)}$$

Examples:

$$(16a^3 + 8a^2)(- 6a - 3)$$

$$8a^2(2a+1) - 3(2a+1)$$

$$\boxed{(8a^2-3)(2a+1)}$$

$$\left(\frac{8x^2}{4x} + \frac{12x}{4x}\right)(+ 2xy + 3y)$$

$$4x(2x+3)\, y(2x+3)$$

$$\boxed{(4x+y)(2x+3)}$$

Examples:

$$\left(\frac{a^3}{a^2} + \frac{a^2b}{a^2}\right)\left(+\frac{ab}{b} + \frac{b^2}{b}\right)$$

$$a^2(a+b)\,b(a+b)$$

$$\boxed{(a^2+b)(a+b)}$$

$$2xy\ \boxed{+\ 5x}\ \boxed{-\ x^2}\ -\ 10y$$

$$\left(\frac{2xy}{2y}-\frac{10y}{2y}\right)+5x-x^2$$

$$2y(x-5)-x(-5+x)$$

$$\boxed{(2y-x)(x-5)}$$