Warm Up **11/20/18**

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

$9x^2-24x+16$

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

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

2. Simplify: $(3x^2)^2$

$9x^4$

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

$x = 1^{st}$ 46

$x+2 = 2^{nd}$ 48

$x+4 = 3^{rd}$ 50

$46+48$

94

$3x+6 = 144$

$-6 \quad -6$

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

$x = 46$

Directions: Simplify the following polynomials.

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

What is FACTORING??? Separating a Polynomial back into a Product

$4a^2+8a$ → $4a(a+2)$

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:

$3x + 12$

$3(x+4)$

$8m + 36n$

$4(2m+9n)$

$6a^2 + 27$

$3(2a^2+9)$

$21cd - 3d$

$3d(7c-1)$

$21cd-3d$

EXAMPLES:

$15a^2b - 30ab$

$15ab(a-2)$

$ab - a$

$a(b-1)$

$5x - 13y$

PRIME

$2x^2y - 2xy^2 + 4xy$

$2xy(x-y+2)$

EXAMPLES:

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

$2y^2(3y^2+7y-5)$

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

$14h(gh+2g+1)$

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

$mn(m^2-mn+5n^2)$

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

$5a(7a-4b^2+3)$

4 Terms

Factor by GROUPING

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

FOIL

BOX

Examples:

$(x^3 + 4x^2) + (8x + 32)$

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

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

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

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

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

Examples:

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

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

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

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

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

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

Examples:

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

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

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

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

$(8x^2 + 12x + 2xy + 3y)$

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

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

$8x^2+12x+2xy+3y$

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

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

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

$2xy + 5x - x^2 - 10y$

$(-x^2+5x) + (2xy-10y)$

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

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