ALGEBRAIC EXPRESSIONS (REVIEW)

An **algebraic expression** is a mathematical statement made up of terms and operations.

1) Distributive Property (Rainbow)

**Only necessary when... there is a number 'attached' to a bracket with multiplication

Remember –(x + 1) is the same as –1(x + 1)

Simplify

a) $2(x + 1)$

$= 2x + 2$

b) $(2x - 7)6$

$= 12x - 42$

c) $2x - 1(x - 1)$

$= 2x - 1x + 1$

$= 1x + 1$

d) $3y + 6(2y + 1)$

$= 3y + 12y + 6$

$= 15y + 6$

e) $4x + (3x - 1)$

$= 4x + 3x - 1$

$= 7x - 1$

f) $-5(4x - 10)$

$= -20x + 50$

2) Collecting Like Terms

"**Like Terms**" have exactly the **same variable** raised to the **same exponent.** Simplify equations by collecting like terms. A simplified expression will have NO like terms.

Simplify

a) $2b + 7a + 8b - a + 3b^2$

$= 3b^2 + (2b + 8b) + (7a - a)$

$= 3b^2 + 10b + 6a$

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

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

$= 2x^2 + 5x - 1$

3) Exponents and Squaring

$y + y + y =$ $3y$ **BUT** $(y)(y)(y) =$ y^3

Expand (and simplify c and d)

a) $a^3 = (a)(a)(a)$

b) $2^3 = (2)(2)(2)$

c) $(2y)^3 = (2y)(2y)(2y)$

$= (4y^2)(2y)$

$= 8y^3$

OR $(2y)^3$

$= (2)^3(y^3)$

$= 8y^3$

d) $3x + (-3x)^2 - 1(x + 1)$

$= 3x + (-3)^2(x)^2 - 1x - 1$

$= 3x + 9x^2 - 1x - 1$

$= 9x^2 + 2x - 1$

Exponent Rules: $a^m + a^n = a^m + a^n$ $a^m \times a^n = a^{m+n}$ $(ab)^m = a^m b^m$

$(a^m)^n = a^{mxn}$ $a^m \div a^n = a^{m-n}$

4) Evaluating Algebraic Expressions

Substitute the value for the variable and solve.

Solve

a) $2x + 3$ For $x = 3$

$= 2(3) + 3$

$= 6 + 3$

$= 9$

b) $2x + 3$ For $x = -4$

$= 2(-4) + 3$

$= -8 + 3$

$= -5$

c) $4x^2$ For $x = 2$

$= 4(2)^2$

$= 4(4)$

$= 16$

d) $(4x)^2$ For $x = 2$

$= [4(2)]^2$

$= (8)^2$

$= 64$

5) Factors of Numbers

A factor is a number or expression that divides EVENLY into another number or expression.

Solve

a) Factor 20

1	20
-1	-20
2	10
-2	-10
4	5
-4	-5

b) Factor 16

1	16
-1	-16
2	8
-2	-8
4	4
-4	-4

c) Factor -27

1	-27
-1	27
3	-9
-3	9

d) Factor -12

1	-12
-1	12
2	-6
-2	6
3	-4
-3	4

6) Integer Pairs

"**Sum**" means Addition "**Product**" means Multiplication

Find two integers that that meet the requirements

a) Multiply to 24
Add to 11

1	24
-1	-24
2	12
-2	-2
3	**8**
-3	-8
4	6
-4	-6

$8 + 3 = 11$

∴ 8 & 3

b) Multiply to -36
Add to -9

1	-36
-1	36
2	-18
-2	18
3	**-12**
-3	12
4	-9
-4	9

$3 + (-12) = -9$

∴ 3 & -12

c) Multiply to -12
Add to 4

1	-12
-1	12
2	-6
-2	**6**
3	-4
-3	4

$(-2) + 6 = 4$

∴ -2 & 6