Communicating With Algebra -Polynomials

The expression $4x^2$ is called a **term**.

A **term** is a number or a variable. or the product of numbers and variables.

Examples – 5, x, y^3 6x $4xy^3$ are examples of terms

A term, for example $4xy^3$ consists of **two parts:** 4 xy^3

coefficient **variable**

The **coefficient** (4) is also called the **numerical coefficient**.

The **variable** (xy^3) is also called the **literal coefficient**. Exponents on the variables belong to the literal coefficient because they represent a product of variables ie y^3 = y x y x y

Like terms have the same (identical) variables or literal coefficients

example: 14 x, 3.5 x -25x are all like terms

$35xy^2z$, $-123xy^2z$, $2\ xy^2z$ are all like terms

Unlike terms have different variables or literal coefficients.

example: 14x, 3.4xy $-45x^2$ are unlike terms

A **polynomial** is an algebraic expression that consists of one or more terms connected by addition or subtraction operators.

A polynomial can be classified by the number of terms it has.

The expression $4xy^2$ consists of one term so it is called a **monomial.**

Mono means one.

The expression 5x + 6 has two terms 5x and 6 so it is called a **binomial.**

Bio means two.

The expression $8x^2 – 3x + y$ has three terms, $8x^2$, -3x and y, so it is called a **trinomial.**

Tri means three.

The **degree of a term** = the sum of the variables in a term and includes the sum of the exponents in a term.

The degree each of the following terms are:

4x - degree of term is 1 – there is one x

$5x^2$ – degree of term is 2 – there is two x's $x^2 = (x)(x)$

25 – degree of term is 0 – there is no variables.

$14xy^3z$ – degree of term is 5 – there is one x, three y's and one z.

$25a^2b^3cd^4$ –degree of term is 10 – there is 2 a's, 3 b's, 1 c, and 4 d'

The **degree of a polynomial** = the degree of the highest-degree term.

The degree of each of the following polynomials are:

$x + 3$ - the degree of the polynomial is 1 as the degree of term x is one and of 3 is 0.

$5x^2 – 2x$ - the degree of the polynomial is 2 because the highest degree of term $(5x^2)$ is 2

$12xyz^2 + 2y^{20}$ – the degree of the polynomial is 20 because the highest degree of term $(2y^{20})$, where as $12xyz^2$ has a degree of term of 4.

Algebraic Models are used to Solve Problems

Cheryl works part-time as a ski instructor. She earns $125 for the season, plus $20 for each children's lesson and $30 for each adult lesson that she gives.

a) ***Write an expression that describes Cheryl's total earnings for the season.***

Let c represent the number of children lessons that she gives and
a represent the number of adult lessons that she gives.

Cheryl's total earnings = $20c + 30a + 125$

b) One winter, Cheryl gave eight children's lessons and six adult lessons. What were her total earnings?

Her earnings are expressed as $20c + 30a + 125$
Substitute $c = 8$ and $a = 6$, then evaluate the expression

Cheryl's earnings = $20c + 30a + 125$
$= 20(8) + 30(6) + 125$
$= 160 + 180 + 125$
$= 465$

Cheryl's total earnings for this season were $465.