C1 - Polynomial Intro & Review

Understand the value of using algebra

Know basic polynomial definitions (monomial, binomial, trinomial, polynomial)
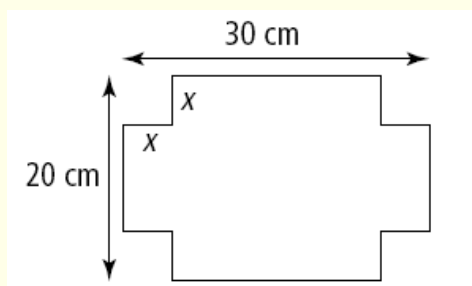
Add & Subtract Polynomials

Why use Algebra?

Algebra allows us to represent things that change.

Example

An open-top box is made from a rectangular sheet of thin cardboard. The corner pieces are cut out as shown in the diagram. A metal corner piece reinforces the corner.

The size of square that is cut from the corners will affect:

- dimensions of box
- volume of box
- surface area of box
- amount of wasted material
- etc.

Write expressions for the dimensions of the open top box, in terms of x.

Challenge: Write expressions for the volume and surface area of the box.

Why use Algebra?

Algebra allows us to show the relationship between things that change.

Example

The path of a soccer ball can be modeled by the equation: $h = -2t^2 + 8t$

where h = height of the soccer ball in metres
t = time elapsed in seconds.

Calculate the height of the soccer ball after 1s, 2s, 3s, etc.
Sketch a graph of the height of the soccer ball over time.
How would you calculate the initial height of the soccer ball?
How long until the soccer ball hits the ground?

Definitions

Polynomial - one term or the sum of terms. Terms must have whole number exponents.

$$e.g. \quad x^2 + 3xy - 2y^2 - 5$$

Monomial - a polynomial with one term.

$$e.g. \quad 14, \; 5x^2$$

Binomial - a polynomial with two terms.

$$e.g. \quad x + 3, \; 2x - 5y$$

Trinomial - a polynomial with three terms.

$$e.g. \quad x^2 + 3x - 1$$

Definitions Practice

For each expression, identify whether it is a monomial, binomial, trinomial, or polynomial.

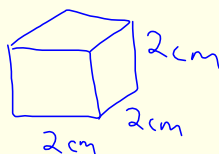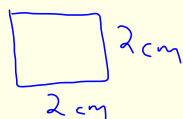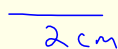$a)\ \ 3p^2$

$b)\ \ 2h^2 + h - 3$

$c)\ \ (3x)(5y)$

$d)\ \ p^2 - 64$

$e)\ \ 2x^2 - 4x + 6$

Adding & Subtracting Polynomials

Answer each of the following.

a) How much space do each of the following objects occupy? How much is there altogether if you were to add all the shapes together?
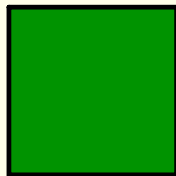

b) $\dfrac{1}{2} + \dfrac{1}{4} + \dfrac{1}{8} =$

c) $2x^2 + 3x + 2 =$

3

Adding & Subtracting Polynomials
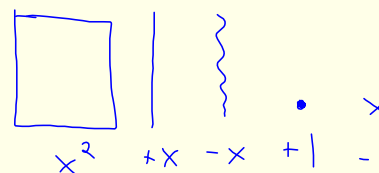
Combine Like Terms

In order to add & subtract polynomials the terms need to be the same size.

Algebra Tiles Review

Note:
unshaded = negative

Pictorial Algebra Tiles Notation

x^2　　$+x$　$-x$　$+1$　-1

Algebra tiles help us see that we may only combine "like" terms.

$eg. \quad 2x^2 + 3x + 2 =$　　　　$eg. \quad (2x^2 + 3x + 2) + (x^2 + 4x - 1) =$

Practice:　Adding & Subtracting Polynomials
　　　　　　　Factoring Monomials