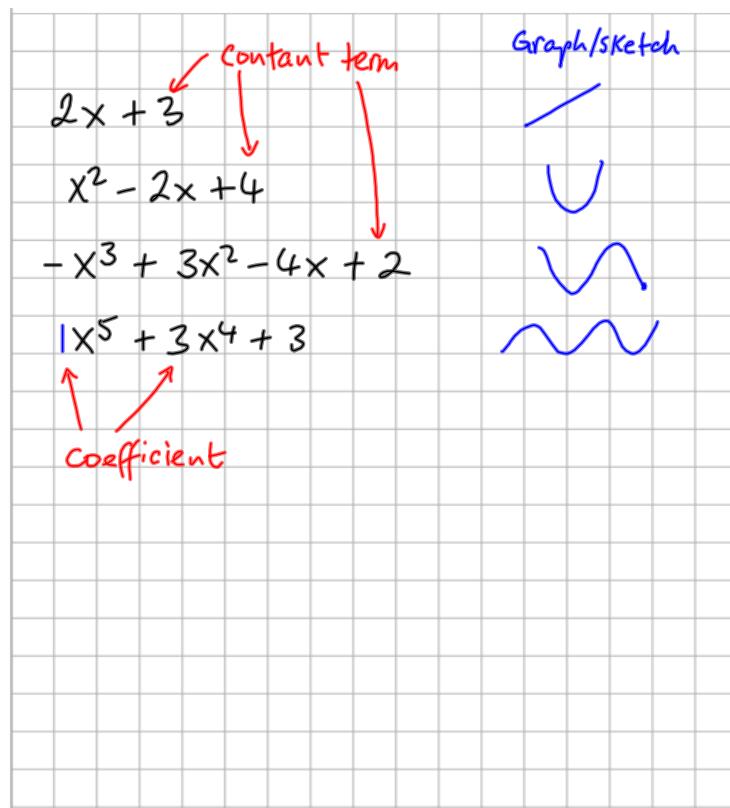


Polynomials expressions

Linear
Quadratic
Cubic
Polynomial of degree 5



2. Multiplying polynomial expressions

To multiply algebraic expressions, we use the distributive law, i.e. $a(b + c) = ab + ac$.

Example 2

Simplify the following: $(x - 5)(2x^2 - 3x + 6)$

Step 1: expand

Step 2: Simplify

$$(x - 5)(2x^2 - 3x + 6)$$

$$x(2x^2 - 3x + 6) - 5(2x^2 - 3x + 6)$$

$$\underline{2x^3} - \underline{3x^2} + \underline{6x} - 10x^2 + 15x - 30$$

$$2x^3 - 13x^2 + 21x - 30$$

Perfect Squares

numbers

$$\begin{array}{ll} 25 & = 5^2 \\ 36 & = 6^2 \\ 144 & = 12^2 \\ 225 & = 15^2 \end{array}$$

Simple
expressions

$$\begin{array}{ll} x^2 & = (x)(x) \\ x^4 & = (x^2)(x^2) \\ 4x^2 & = (2x)(2x) \end{array}$$

Binomial
expression

$$(x+2)^2 = x(x+2) + 2(x+2)$$

$$x^2 + 2x + 2x + 4$$

$$x^2 + 4x + 4$$

Is this a
perfect
square?

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

Not perfect square

Is this a
perfect square?Formula
to expand
binomial
squares

(i) $x^2 - 10x + 25 = (x-5)(x-5)$

$$= (x-5)^2 \text{ yes}$$

(ii) $a^2 + 2ab + b^2 = (a+b)(a+b)$

$$= (a+b)^2 \text{ yes}$$

(iii) $a^2 - 2ab + b^2 = (a-b)(a-b)$

$$= (a-b)^2$$

* use
 $(a+b)^2 = a^2 + 2ab + b^2$
 to expand squares

* $(2x-3)^2 = 4x^2 - 12x + 9$

↑ ↑ ↑
 square 1st term multiply terms and double square last term

* $(3-4x)^2 = 9 - 24x + 16x^2$

7. Expand each of the following perfect squares.

(i) $(x + 2)^2$

(ii) $(x - 3)^2$

(iii) $(x + 5)^2$

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

(v) $(x - y)^2$

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

(vii) $(3x - y)^2$

(viii) $(x - 5y)^2$

(ix) $(2x + 3y)^2$

Remember

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

