

Section P.3: Polynomials

Key Topics: polynomials, operations of polynomials

Polynomials in One Variable

A **polynomial** in x is any _____ of monomials in x . By _____ like terms, we can write any polynomial in the form

$$a_n x^n + a_{n-1} x^{n-1} + \cdots + a_2 x^2 + a_1 x + a_0,$$

where n is either a _____ integer or _____ and $a_n, a_{n-1}, \dots, a_1, a_0$ are _____, called the _____ of the polynomial. If $a_n \neq 0$, then n , the _____ exponent on x , is called the _____ and a_n is called the _____ of the polynomial. The _____ $a_n x^n, a_{n-1} x^{n-1}, \dots, a_2 x^2, a_1 x$, and a_0 are the _____ of the polynomial. The monomial _____ is the _____ **term** of the polynomial, and _____ is the _____ **term**.

Special-Product Formulas

A and B represent any algebraic expressions.

Formula

Product giving a _____ of squares

$$(A + B)(A - B) = \underline{\hspace{2cm}}$$

_____ a binomial sum or difference

$$(A + B)^2 = \underline{\hspace{2cm}}$$

$$(A - B)^2 = \underline{\hspace{2cm}}$$

_____ a binomial sum or difference

$$(A + B)^3 = \underline{\hspace{2cm}}$$

$$(A - B)^3 = \underline{\hspace{2cm}}$$

_____ giving a sum or difference of cubes

$$(A + B)(A^2 - AB + B^2) = \underline{\hspace{2cm}}$$

$$(A - B)(A^2 + AB + B^2) = \underline{\hspace{2cm}}$$

Example

$$(5x + 2)(5x - 2) = \underline{\hspace{2cm}}$$

$$= \underline{\hspace{2cm}}$$

$$(3x + 2)^2 = \underline{\hspace{2cm}}$$

$$= \underline{\hspace{2cm}}$$

$$(2x - 5)^2 = \underline{\hspace{2cm}}$$

$$= \underline{\hspace{2cm}}$$

$$(x + 5)^3 = \underline{\hspace{2cm}}$$

$$= \underline{\hspace{2cm}}$$

$$(x - 4)^3 = \underline{\hspace{2cm}}$$

$$= \underline{\hspace{2cm}}$$

$$\underline{\hspace{2cm}} = x^3 + 2^3 = x^3 + 8$$

$$\underline{\hspace{2cm}} = x^3 - 3^3 = x^3 - 27$$