CHAPTER 9: POLYNOMIALS & FACTORING

Adding & Subtracting Polynomials

OBJECTIVES

- I can describe polynomials
- I can add and subtract polynomials

PART 1: DESCRIBING POLYNOMIALS

A **monomial** is an expression that is a number, a variable, or a product of a number and one or more variables. Each of the following is a monomial.

$12 \qquad y \qquad -5x^2y \qquad \frac{c}{3}$

The fraction $\frac{c}{3}$ is a monomial, but the expression $\frac{c}{x}$ is *not* a monomial because there is a variable in the denominator.

PART 1: DESCRIBING POLYNOMIALS

The **degree of a monomial** is the sum of the exponents of its variables. For a nonzero constant, the degree is 0. Zero has no degree.

1 EXAMPLE **Degree of a Monomial**

Find the degree of each monomial.

a. $\frac{2}{3}x$

b. $7x^2y^3$

c. -4

PART 1: DESCRIBING POLYNOMIALS

A **polynomial** is a monomial or the sum or difference of two or more monomials.

$$3x^4 + 5x^2 - 7x + 1$$
$$\text{degree} \rightarrow \quad 4 \quad 2 \quad 1 \quad 0$$

The polynomial shown above is in standard form. **Standard form of a polynomial** means that the degrees of its monomial terms decrease from left to right. The **degree of a polynomial** in one variable is the same as the degree of the monomial with the greatest exponent. The degree of $3x^4 + 5x^2 - 7x + 1$ is 4.

PART 1: DESCRIBING POLYNOMIALS

After you simplify a polynomial by combining like terms, you can name the polynomial based on its degree or the number of monomials it contains.

Polynomial	Degree	Name Using Degree	Number of Terms	Name Using Number of Terms
$7x + 4$	1	linear	2	binomial
$3x^2 + 2x + 1$	2	quadratic	3	trinomial
$4x^3$	3	cubic	1	monomial
$9x^4 + 11x$	4	fourth degree	2	binomial
5	0	constant	1	monomial

PART 1: DESCRIBING POLYNOMIALS

2 Write each polynomial in standard form. Then name each polynomial based on its degree and the number of its terms.

a. $6x^2 + 7 - 9x^4$ **b.** $3y - 4 - y^3$ **c.** $8 + 7v - 11v$

PART 2: ADDING POLYNOMIALS

3 Simplify each sum.

a. $(12m^2 + 4) + (8m^2 + 5)$ **b.** $(t^2 - 6) + (3t^2 + 11)$

c. $(9w^3 + 8w^2) + (7w^3 + 4)$ **d.** $(2p^3 + 6p^2 + 10p) + (9p^3 + 11p^2 + 3p)$

PART 3: SUBTRACTING POLYNOMIALS

4 Simplify each difference.

a. $(v^3 + 6v^2 - v) - (9v^3 - 7v^2 + 3v)$ **b.** $(30d^3 - 29d^2 - 3d) - (2d^3 + d^2)$

c. $(4x^2 + 5x + 1) - (6x^2 + x + 8)$

CAN YOU?? PROVE IT!!

- I can describe polynomials
- I can add and subtract polynomials
  - Go back and finish all the blank problems ☺