

key**Section 6.2: Polynomial Operations I**

- Concept I
  - Definitions
    - Degree of a polynomial: \_\_\_\_\_
    - Writing terms in descending order: \_\_\_\_\_
  - Evaluating a polynomial
  - Adding polynomials
  - Subtracting polynomials
- Concept II
  - Multiplying a monomial by a monomial
  - Multiplying a polynomial by a monomial
  - Dividing a monomial by a monomial
  - Dividing a polynomial by a monomial

**Section 6.3: Polynomial Operations II**

- Concept I
  - Using the FOIL method to multiply two binomials
  - Using patterns to multiply two binomials
- Concept II
  - Multiplying polynomials with two or more terms
  - Multiplying more than two polynomials
  - Dividing a polynomial by a polynomial

**Practice Problems**

1.)  $(z^{12})^4 = z^{48}$

2.)  $(2y)^3 = 8y^3$

3.)  $\frac{42mn^6p^3q^4}{28m^2nq^2}$

$$= \frac{3n^5p^3}{2mq}$$

4.)  $\frac{14x + 8mn^3}{2xy}$

$$= \frac{14x}{2xy} + \frac{8mn^3}{2xy}$$

$$= \frac{7}{y} + \frac{4mn^3}{xy}$$

$$5.) \frac{x^3 y^7 z^{12}}{xy^8 z^5} = \frac{x^2 z^7}{y}$$

$$6.) (a+7b)(2a-3b) \\ = 2a^2 + 14ab - 3ab - 21b^2 \\ = 2a^2 + 11ab - 21b^2$$

$$7.) 2^1 - (3x)^0 - y^0 \\ = 2 - 1 - 1 \\ = 0$$

$$8.) (m-12n)(m+12n) \\ = m^2 - 12nm + 12nm - 144n^2 \\ = m^2 - 144n^2$$

$$9.) (2y^2 + 6xy + 3y) + (y^2 - y) \\ = 2y^2 + 6xy + 3y + y^2 - y \\ = 3y^2 + 6xy + 2y$$

$$10.) (x+3)^2 \\ = (x+3)(x+3) \\ = x^2 + 3x + 3x + 9 \\ = x^2 + 6x + 9$$

$$11.) (8x^3 + 9x^2 + 17) - (5x^3 - 3x^2 + 15) \\ = \cancel{8x^3} + 9x^2 + 17 - 5x^3 + 3x^2 - 15 \\ = 3x^3 + 12x^2 + 2$$

$$12.) (x^3 - 26x + 5) \div (x-5)$$

$x-5$	$x^3 + 5x^2 - 26x + 5$
	$-(x^3 - 5x^2)$
	<hr/>
	$5x^2 - 26x + 5$
	$-(5x^2 - 25x)$
	<hr/>
	$-x + 5$
	$-(-x + 5)$
	<hr/>
	$0$

$$13.) -3w^2 x^3 y^2 z \cdot 2x^2 yz^2 \\ = -6x^5 y^3 z^3 w^2$$

$$14.) (8x^3 - 18x^2 + 25x - 12) \div (4x-3)$$

$4x-3$	$8x^3 - 18x^2 + 25x - 12$
	$-(8x^3 - 6x^2)$
	<hr/>
	$-12x^2 + 25x - 12$
	$-(-12x^2 + 9x)$
	<hr/>
	$16x - 12$
	$-(16x - 12)$
	<hr/>
	$0$