

## ADDING AND SUBTRACING POLYNOMIALS

A **MONOMIAL** is Single term expression.

Ex:  $5x^2$  or  $-6xy^3$  or  $3x^3$

A **POLYNOMIAL** is An expression with 2 or more terms.

Some special types of polynomials are:

- I) Binomial: 2 terms:  $(3x + y)$   
II) Trinomial: 3 terms:  $3x^2 + 2x + 7$

“Like Terms” have same letters and exponents.

Ex1: Terms that are “LIKE”

$3x^2y$  and  $5x^2y$

Ex2: Terms that are “NOT LIKE”

$3x^2y$  and  $6xy^2$

**ADDING POLYNOMIALS:** Add like terms only.

Ex 1:  $(4x^2 + 6x + 7) + (2x^2 - 9x + 1)$

$4x^2 + 6x + 7 + 2x^2 - 9x + 1$

$= 6x^2 - 3x + 8$

Ex 2:  $12m^2 + 4$   
 $+ (8m^2 + 5)$

$= 20m^2 + 9$

Ex 3:  $(9w^3 + 8w^2) + (7w^3 + 4)$

$= 16w^3 + 8w^2 + 4$

Ex 4:  $(2p^3 + 6p^2 + 10p) + (9p^3 + 11p^2 + 3p)$

$= 11p^3 + 17p^2 + 13p$

## SUBTRACTING POLYNOMIALS:

CAUTION: Watch out for Sign Changes !

Ex 5:  $(2x^3 + 5x^2 - 3x) - (x^3 - 8x^2 + 11x)$   
 $= 2x^3 + 5x^2 - 3x - x^3 + 8x^2 - 11x$

$$= x^3 + 13x^2 - 14x$$

Ex 6:  $(30x^3 - 29x^2 - 3x) - (2x^3 + x^2)$

$$= 30x^3 - 29x^2 - 3x - 2x^3 - x^2$$

$$= 28x^3 - 30x^2 - 3x$$

Ex 7:  $v^3 + 6v^2 - v$   
 $- (-9v^3 - 7v^2 + 3v)$

$$= 10v^3 + 13v^2 - 4v$$

Ex 8:  $(2x^2 - 6x) - (3x^3 + 2) + (5x^2 + 2x - 7)$

$$= 2x^2 - 6x - 3x^3 - 2 + 5x^2 + 2x - 7$$

$$= 7x^2 - 4x - 3x^3 - 9$$

## Check for Understanding:

1. Create two polynomials that have like terms. Subtract one polynomial from the other.

$$\begin{aligned} & (2x^2 + 3x - 4) - (6x^2 - 2x - 5) \\ &= 2x^2 + 3x - 4 - 6x^2 + 2x + 5 \\ &= -4x^2 + 5x + 1 \end{aligned}$$

2. Create three polynomials that have like terms. Add the polynomials together.

$$\begin{aligned} & (2x+1) + (3x^2-7x) + (6x-x^2) \\ &= \boxed{2x} + 1 + 3x^2 - \boxed{7x} + \boxed{6x} - x^2 \\ &= x + 1 + 2x^2 \end{aligned}$$