

Name: LEY Hour: \_\_\_\_\_ Date: \_\_\_\_\_

## NOTES: Section 10.1 – Adding and Subtracting Polynomials

Goals: #1 - I can add and subtract polynomials.



Homework: Section 10.1 Worksheet

Notes:

A Monomial is an expression that is either a number, a variable, or the product of a number and one or more variables.

Examples:  $x$ ,  $3y$ ,  $7x^2yz$ ,  $\frac{1}{2}xy^2$ ,  $8$

A Polynomial is a monomial or a sum of monomials.

Examples:  $4x^3$ ,  $x^3 - 8$ ,  $7x^2 - 4x + 6$

- A Binomial is the sum of two monomials.

Examples:  $x^2 - 4$ ,  $-9x + 3$ ,  $3x^3 + 1$

- A Trinomial is the sum of three monomials.

Examples:  $x^2 - 4x + 4$ ,  $-x^3 + 2x + 1$

A polynomial function is in standard form

if its terms are written in descending order of exponents from left to right.

The degree of a polynomial is the largest exponent of that variable.

| Common Polynomial Functions |        |           |                               |
|-----------------------------|--------|-----------|-------------------------------|
| Polynomial                  | Degree | Type      | Identified By Number of Terms |
| $6$                         | $0$    | constant  | monomial                      |
| $3x + 1$                    | $1$    | Linear    | binomial                      |
| $-x^2 + 2x - 5$             | $2$    | Quadratic | trinomial                     |
| $4x^3 - 8x$                 | $3$    | Cubic     | binomial                      |
| $x^4 - 3x^3 + 1$            | $4$    | Quartic   | trinomial                     |

Name: \_\_\_\_\_ Hour: \_\_\_\_\_ Date: \_\_\_\_\_

Example #1: Identify the polynomial by degree and number of terms.

1.  $8x$

2.  $10x - 5$

3.  $4 - 4x + x^2$

D: 1

1

2

Type: Linear

Linear

Quadratic

Terms: Monomial

Binomial

Trinomial

Example #2: Write the polynomial in standard form.

1.  $-2x + 5x^3 - 6$

2.  $8 + 5y^2 - 3y$

3.  $-4b^2 + 7b^3$

$5x^3 - 2x - 6$

$5y^2 - 3y + 8$

$7b^3 - 4b^2$

You practice:

1. Identify the polynomial by degree and number of terms.

a.  $20m^3$

b.  $-2x + 5x^2 - 6$

D: 3

2

Type: Cubic

Quadratic

Terms: Monomial

Trinomial

2. Write the polynomial in standard form.

a.  $x - x^3 + 3x^2 + 9$

b.  $x - 3x^4 + 1$

$-x^3 + 3x^2 + x + 9$

$-3x^4 + x + 1$

Name: \_\_\_\_\_ Hour: \_\_\_\_\_ Date: \_\_\_\_\_

Notes:

To add or subtract polynomials, simply combine like terms.

Example #3: Add or subtract the following polynomials.

$$1. (\underline{5x^3} - \underline{2x} + \underline{x^2} + \underline{7}) + (\underline{3x^2} + \underline{7} - \underline{4x})$$

$$5x^3 + x^2 + 3x^2 - 2x - 4x + 7 + 7$$

$$\boxed{5x^3 + 4x^2 - 6x + 14}$$

$$2. (\underline{2x^2} + \underline{x} - \underline{5}) + (\underline{x} + \underline{x^2} + \underline{6})$$

$$2x^2 + x^2 + x + x - 5 + 6$$

$$\boxed{3x^2 + 2x + 1}$$

$$3. (\underline{-2x^3} + \underline{5x^2} - \underline{4x} + \underline{8}) + (\underline{+2x^3} + \underline{-3x} + \underline{4})$$

$$-2x^3 + 2x^3 + 5x^2 - 4x + -3x + 8 + 4$$

$$\boxed{5x^2 - 7x + 12}$$

$$4. (\underline{3x^2} - \underline{5x} + \underline{3}) + (\underline{-2x^2} + \underline{x} + \underline{4})$$

$$3x^2 + -2x^2 - 5x + x + 3 + 4$$

$$\boxed{x^2 - 4x + 7}$$

Name: \_\_\_\_\_ Hour: \_\_\_\_\_ Date: \_\_\_\_\_

Example #3: Add or subtract the following polynomials.

1.  $(\underline{8x^2} - \underline{2x} + \underline{4}) + (\underline{4x^2} - \underline{1} - \underline{3x^3})$

$$-3x^3 + 8x^2 + 4x^2 - 2x + 4 - 1$$

$$\boxed{-3x^3 + 12x^2 - 2x + 3}$$

2.  $(\underline{12x} - \underline{8x^2} + \underline{6}) + (\underline{-8x^2} + \underline{3x} + \underline{-4})$

$$-8x^2 + 8x^2 + 12x + 3x + 6 + -4$$

$$\boxed{15x + 2}$$