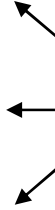


NOTES: CLASSIFYING AND MULTIPLYING POLYNOMIALS

What is a Polynomial?

An _____ of two or more algebraic _____.

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



Terms

Standard Form of a Polynomial

The standard form of a polynomial that contains one variable is written in alpha order with the terms in order from the _____ exponent to the _____ exponent. When written in standard form, the coefficient of the first term is the _____ coefficient.

Leading Coefficient

$$\rightarrow 4x^4 - 2x^3 + 3x^2 - x + 4$$

Classifying Polynomials by Number of Terms

Number of Terms	Classification	Examples
1		$5x$
2		$2x + 7$
3		$5x^2 - 2x - 4$
4 or more		$3x^3 - 2x^2 - x + 4$

Some polynomials have special names based on their **degree** and the **number of terms** they have.

Classifying Polynomials by Degree

Degree

$$3x^4$$

The **degree** of a polynomial is the degree of the term with the _____ degree (i.e. highest exponent).

Degree	Classification	Examples
0	Constant	4
1	Linear	$7x$
2	Quadratic	$3x^2 + 1$
3	Cubic	$4x^3 - 2x^2 + 1$
4	Quartic	x^4

Rewrite each polynomial in standard form. Then classify by degree and number of terms.

1. $15 - 4x^2 + 2x^5$ Standard Form:	Degree	Number of Terms
2. $20x - 4x^3 + 1 - x^2$ Standard Form:	Degree	Number of Terms
3. $y^3 + y^4 - 3y$ Standard Form:	Degree	Number of Terms
4. $1 + 3x$ Standard Form:	Degree	Number of Terms
5. $-2x^2$ Standard Form:	Degree	Number of Terms

Multiply and Monomial by a Polynomial

$$2x^2(4x^4 - 3x^3 + 2x - 1)$$

Recall your
Product Rule!

$$x^m \cdot x^n = x^{m+n}$$

6. $6x(5x^2 - 10x)$	7. $-3m^2(-12m^2 - 8m + 5)$
8. $7x^3(5x^5 + 9x^2)$	9. $2ab^2(8a + 7b)$
10. $-\frac{1}{2}x^3y^2(10x^4 + 6x^3y - 2x^2y^4)$	11. $2x^7y(6x^5 + 5x^3y^2 - 3xy^4 - 1)$

Name: _____

Date: _____

Period: _____

A. CLASSIFYING AND MULTIPLYING POLYNOMIALS

Rewrite each polynomial in standard form. Then classify by degree and number of terms.

1. $6 - 3x^3 + x^4 + 7x$ Standard Form: _____	Degree _____	Number of Terms _____
2. $2x$ Standard Form: _____	Degree _____	Number of Terms _____
3. $3x + 4x^2 - 1$ Standard Form: _____	Degree _____	Number of Terms _____
4. $2x - 4x^3$ Standard Form: _____	Degree _____	Number of Terms _____

Multiply each monomial by the polynomial.

5. $5x^2(3x + 1)$	6. $3x^5(12x^2 - 2x - 5)$
7. $5xy^2(9x^2 - 4xy)$	8. $-6m^2n(-7m^4n^2 - 15m^2)$
9. $4m^3(3m + 7n^2)$	10. $2a^4b^2(5a^5b + 7a^3b^2 - 3ab + 4bc)$
11. $\frac{1}{2}x^4(12x^3 + 6x^2 - 8xy)$	12. $12x^3y(4x^2y + xy^2 - x - 1)$
13. $-2ab(5a^2b^2 + 21ab^2)$	14. $4x^2y^2(7x^2 - 8xy - 9xy^2)$
15. $xy^2(x^2y - x^2 + 4x + 2)$	16. $3x^3y^2(8x^3y^5 + 20x^2y^3)$