You will study

- Operations & multiplying with polynomials
- Long division
- Factoring polynomial expressions
- The zeros of polynomial functions
- The roots of polynomial equations
- The intercepts of polynomial graphs
- Solving polynomial equations by factoring
- Simplifying Radicals and the Discriminant
- · Solving quadratic equations with the Quadratic Formula
- Solving quadratic equations by Completing the Square

Unit 1

Polynomials

Aug 24-3:08 PM

1-1: Operations/Multiplying with Polynomials

Term - a number or product of numbers and variables: 3xy

Monomial - a single term: 3, $3xy^2$

Polynomial - one or more terms combined as a sum or difference of terms: $3 + 3xy^2$

 $-9x^0 = -9$

Classifying Polynomials

• A polynomial can be named by its # +erms

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Classifying Polynomials by Degree			
Name	Degree	Example	# Terms
Constant	0	-9	1
Linear	1	x – 4	2
Quadratic	2	$x^2 + 3x - 1$	3
Cubic	3	$x^3 + 2x^2 + x + 1$	4

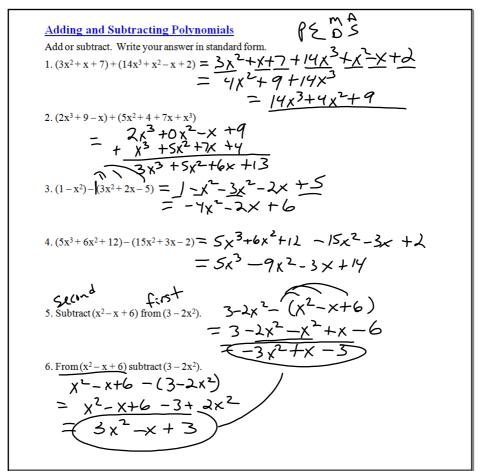
Standard Form (De scending octer)

Leading coefficient

Degree of polynomial

 $5x^3 + 8x^2 + 3x - 17$

Aug 13-1:40 PM



Aug 13-1:57 PM

Multiplying Polynomials

• Remember $(x^a)(x^b) = x^{a+b}$ 1. $x(x^3) = x^a$

$$1. x(x^3) = x^{4}$$

$$_{2.\ 3x^{2}(x^{5})}=3x^{7}$$

3.
$$xy(7x^2) = 7x^3y$$

2.
$$3x^{2}(x^{5}) = 3x^{7}$$

4. $3y^{2}(-3y) = -9y^{3}$

properties of exponents.

$$\sum_{1. 3x^{2}(x^{3}+4)} = 3x^{5} + 12x^{2}$$

$$\sum_{2. ab(a^3+3ab^2-b^3)} = a^4b + 3a^2b^3 - ab^4$$

You try these:
3.
$$3cd^2(4c^2d - 6cd + 14cd^2) = 12c^3d^3 - 18c^2d^3 + 42c^2d^4$$

4.
$$-x^{2}y(6y^{3}+y^{2}-28y+30) = -6x^{2}y^{4}-x^{2}y^{3}+28x^{2}y^{3}-30x^{2}y$$

Aug 13-1:58 PM

Multiplying a binomial and a binomial:

To multiply a binomial by a binomial, use the <u>distributive property and multiply each</u> term in the second polynomial by each term in the first. This is <u>double distribution</u>.

1.
$$(2x-3)(x+5) = 2x^2 + 10x - 3x - 15$$

= $2x^2 + 7x - 15$

$$\frac{y}{2. (4a-3b)(a+3b)} = \frac{4a^2+12ab-3ab-9b^2}{4a^2+9ab-9b^2}$$

Multiplying polynomials:

To multiply two polynomials, use $\underline{\text{double distribution}}. \ Remember this uses the$ distributive property to multiply each term in the second polynomial by each

Examples
$$1. (a-3)(2-5a+a^{2}) = \alpha(2-5a+a^{2}) - 3(2-5a+a^{2})$$

$$= 2a-5a^{2}+a^{3}-6+15a-3a^{2}$$

$$= a^{3}-8a^{2}+17a-6$$

2.
$$\binom{(1+3x-x^2)(x-2)}{(x-2)} = x(1+3x-x^2) - \lambda(1+3x-x^2)$$

= $x + 3x^2 - x^3 - \lambda - 6x + 3x^2$
= $-x^3 + 5x^2 - 5x - \lambda$

You try these:

Ty these:
3.
$$(y^2 + 2y - 12)(x + 2) = (x + 2)(y^2 + 2y - 12)$$

 $= x(y^2 + 2y - 12) + 2(y^2 + 2y - 12)$
 $= xy^2 + 2y^2 + 2xy - 12x + 4y - 2y$
4. $(2x - 3)(x^5 - 4x^3 + 7) = 2x^6 - 3x^5 - 7x^7 + 12x^3 + 14x - 2$

Your assignment is Homework Worksheet 1-1 in your homework packet

Aug 13-2:01 PM