

Registration for the PSAT ends on September 11th. Students can register online by going to the Guidance website and following the PSAT registration link. 11th graders planning on attending a 4 year college are encouraged to sit for the exam. 10th graders enrolled in Algebra 2 are also eligible to sit for the exam. The exam will be Wednesday, October 10th. The cost is \$16.

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You will study

Unit 1

Polynomials

- 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

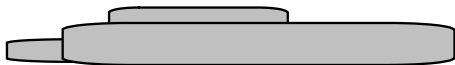
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1-1: Operations/Multiplying with Polynomials

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

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

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



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Classifying Polynomials

- A polynomial can be named by its # of terms and largest degree.

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 *exponents greatest → least*
 Leading coefficient *Degree of polynomial*
 $5x^3 + 8x^2 + 3x - 17$
 Cubic

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Adding and Subtracting Polynomials

Add or subtract. Write your answer in standard form.

1. $(3x^2 + x + 7) + (14x^3 + x^2 - x + 2)$

$= 14x^3 + 4x^2 + 9$

2. $(2x^3 + 9 - x) + (5x^2 + 4 + 7x + x^3)$

$= 3x^3 + 5x^2 + 6x + 13$

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

$= 1 - x^2 - 3x^2 - 2x + 5$

$= -4x^2 - 2x + 6$

4. $(5x^3 + 6x^2 + 12) - (15x^2 + 3x - 2)$

$= 5x^3 + 6x^2 + 12 - 15x^2 - 3x + 2$

$= 5x^3 - 9x^2 - 3x + 14$

5. Subtract $(x^2 - x + 6)$ from $(3 - 2x^2)$.

$(3 - 2x^2) - (x^2 - x + 6)$

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

6. From $(x^2 - x + 6)$ subtract $(3 - 2x^2)$.

$(x^2 - x + 6) - (3 - 2x^2)$

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

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Multiplying Polynomials

- Remember $(x^a)(x^b) = x^{a+b}$

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

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

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

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

Multiplying a monomial and a polynomial:

To multiply a polynomial by a monomial, use the distributive property and the properties of exponents.

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

$= 3x^5 + 12x^2$

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. $-x^2y(6y^3 + y^2 - 28y + 30)$

$= -6x^2y^4 - x^2y^3 + 28x^2y^2 - 30x^2y$

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Multiplying a binomial and a binomial:

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

1. $(2x-3)(x+5)$

$$: 2x^2 + 10x - 3x - 15$$

You try:

2. $(4a-3b)(a+3b)$

$$= 4a^2 + 12ab - 3ba - 9b^2 = 4a^2 + 9ab - 9b^2$$

Multiplying polynomials:

To multiply two polynomials, use double distribution. Remember this uses the distributive property to multiply each term in the second polynomial by each term in the first.

Examples:

1. $(a-3)(2-5a+a^2)$

$$: a(2-5a+a^2) - 3(2-5a+a^2)$$

$$: 2a - 5a^2 + a^3 - 6 + 15a - 3a^2 : a^3 - 8a^2 + 17a - 6$$

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

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

$$: x + 3x^2 - x^3 - 2 - 6x + 2x^2$$

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

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You try these:

3. $(y^2+2y-12)(x+2)$

$$: x(y^2+2y-12) + 2(y^2+2y-12)$$

$$: xy^2 + 2xy - 12x + 2y^2 + 4y - 24$$

4. $(2x-3)(x^3-4x^2+7)$

$$: 2x(x^3-4x^2+7) - 3(x^3-4x^2+7)$$

$$: 2x^4 - 8x^3 + 14x - 3x^3 + 12x^2 - 21 = 2x^4 - 3x^3 - 8x^3 + 12x^2 + 14x - 21$$

Multiply $(x-1)(x^4+x^3+x^2+x+1)$ and combine like terms. Explain how you reached your answer.

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

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