



DeSoto
COUNTY SCHOOLS

**Foundations
to
Algebra**

Week 3

POLYNOMIALS

2 or more algebraic terms separated by addition or subtraction

Highest Exponent

NAMING

Terms separated by + or -

DEGREE

+

NUMBER

OF TERMS

Degree	Name
0	Constant
1	Linear
2	Quadratic
3	Cubic
4	Quartic

# of Terms	Name
1	Monomial
2	Binomial
3	Trinomial
4	Polynomial

ADDING

Combine like terms

$$\begin{aligned} (2x^2 + 3x - 5y + 2) + (5x - 3x^2 + y - 5) \\ 2x^2 + 3x - 5y + 2 + 5x - 3x^2 + y - 5 \\ -x^2 + 8x - 4y - 3 \end{aligned}$$

SUBTRACTING

Distribute the negative, Combine like terms

$$\begin{aligned} (2x^2 + 3x - 5y + 2) - (5x - 3x^2 + y - 5) \\ 2x^2 + 3x - 5y + 2 - 5x + 3x^2 - y + 5 \\ 5x^2 - 2x - 6y + 7 \end{aligned}$$

MULTIPLYING

Multiply everything in the first parenthesis to everything in the second parenthesis

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

$$\begin{aligned} (4x - 5)(2x^2 + 3x - 6) \\ 8x^3 + 12x^2 - 24x - 10x^2 - 15x + 30 \\ 8x^3 + 2x^2 - 39x + 30 \end{aligned}$$

POLYNOMIALS: INTRODUCTION

MONOMIALS:

EXAMPLES:

-4	A number
y	A variable
a^2	The product of variables
$\frac{1}{2}x^2y$	The product of numbers and variables

NON-EXAMPLES:

2^x	Variable as an exponent
$x^2 + 3$	A sum
$5a^{-2}$	Negative exponent
$\frac{3}{x}$	A quotient

Examples: Determine if each expression is a monomial.

1. $-4xy$ 2. $a^2 - 8$ 3. $\frac{x}{5}$ 4. $7z^{-1}$ 5. b^7

POLYNOMIAL: A polynomial is a _____ or the _____ of different monomials.

Determine which expressions are polynomials:

6. $2q$ 7. $d + \frac{c}{d}$ 8. $p + q$ 9. $ab - \frac{a}{4}$ 10. $x^2 + 4x - 8$ 11. $7y^3 - 5y^{-2} + 4y$

SPECIFIC TYPES OF POLYNOMIALS

<u>BINOMIAL:</u>	<u>TRINOMIAL:</u>
<u>Examples:</u>	<u>Examples:</u>

Examples #12 - 19: Determine if each expression is a monomial, binomial, trinomial, or not a polynomial.

12. $2m - 7$ 13. $x^2 + 3x - 4 - 5$ 14. $\frac{5}{2x} - 3$ 15. $3y^2 - 6 + 7y$
16. $3x + 8x - 5x^2$ 17. $8x^3y^2z$ 18. $2a^2 + 3ab - 5ba$ 19. $9r + 11 - 5r^2$

DEGREE: Based on the exponents of the variables.

- The degree of a MONOMIAL:

- The degree of a POLYNOMIAL:

Examples: Find the degree of each polynomial.

20. $5mn^2$

22. $5a^2 + 3$

24. $3x^2 - 7x$

21. $9x^3yz^6$

23. $-4x^2y^2 + 3x^2 + 12$

25. $8m^3 - 2m^2n^2 - 11$

REORDERING TERMS OF A POLYNOMIAL BASED ON DEGREE:

MOVE TERMS AND KEEP THE SIGN WITH THE TERM

Example: Arrange the polynomials in descending order according to the powers of the x.

a) $6x^2 + 5 - 8x - 2x^3$

d) $3a^3x^2 - a^4 + 4ax^5 + 9a^2x$

b) $7x^2 - 11x^4 + 8 - 2x^5$

e) $15x^5 - 2x^2y^2 - 7yx^4 + x^3y$

c) $25x^6 - 3x^2 + 7x^5 + 15x^8$

POLYNOMIALS: ADDITION AND SUBTRACTION**WARM UP ACTIVITY:** Simplify the following

1) $3x - 2y + 4y - 6x$

3) $4z + 2t + 3z - t$

5) $8a + 6b + 6a + 2b$

2) $3x - 12y - 2x^2 + 6y$

4) $5a + 3b - 2c - 8a$

ADDING AND SUBTRACTING POLYNOMIALS:

- When adding and subtracting polynomials, you **COMBINE LIKE TERMS**.
- Be careful of parentheses and positive or negative signs with the operations.

Exp 1: $(3x^2 - 4x + 8) + (2x - 7x^2 - 5)$

Exp 4: $(6y^2 + 8y^4 - 5y) - (9y^4 - 7y + 2y^2)$

Exp 2: $(3n^2 + 13n^3 + 5n) - (7n + 4n^3)$

Exp 5: $(7y^2 + 2y - 3) + (2 - 4y + 5y^2)$

Example 3: $(2b^2 + 8ab^3 + 4b) - (9b - 5ab^3)$

Exp 6: $(3x^2 + 5x + 2) - (4 - 2x) + (5x^2 + 7)$

PRACTICE PROBLEMS: Simplify each expression

1. $x^2 + 2x - 3 + 2x^2 - 7x + 9$

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

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

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

$$5. (3a^2 + a - 4) + (a^2 - 2a - 1)$$

$$6. (t^2 - 1) + (2t + 3)$$

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

$$8. (2x^2 + 5xy + 3y^2) + (8x^2 - 7y^2)$$

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

$$10. (4m - 3n) + (2n + 5m)$$

$$11. (6x + 5) - (3x + 1)$$

$$12. (2a^2 - 3a) + (5b - b^2) + (2a - 8b)$$

$$13. (3z^2 + 5) - (-4z + 2z^2) - (z - 3)$$

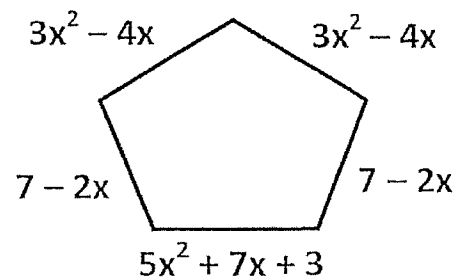
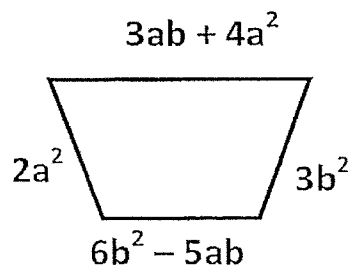
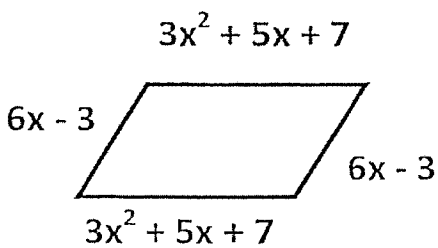
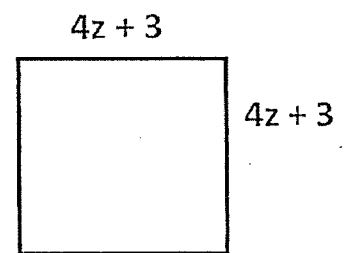
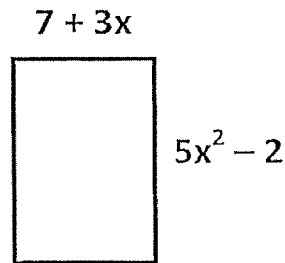
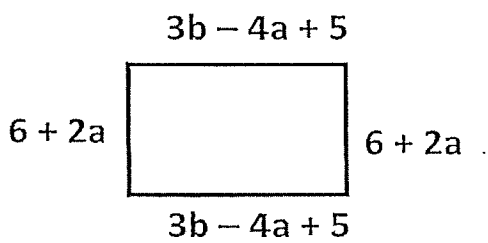
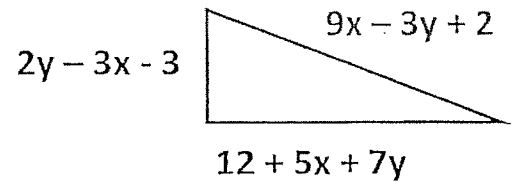
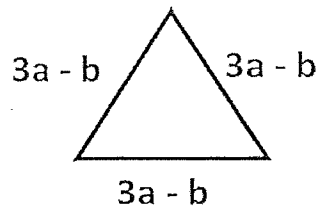
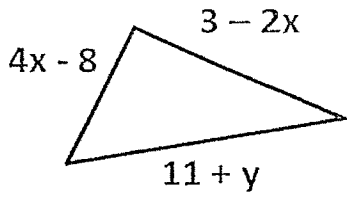
$$14. (3x - 2) - (5x - 4) + (19 + 2x)$$

$$15. (10x^2 + 8x) - (6 + 3x^2) + (2x - 9)$$

$$16. (6m^2 + 7) - (-2m^2) + (2m - 3)$$

Find the PERIMETER of the shape.

Equation: Perimeter = Sum of all the sides



CC Math I Standards: Adding and Subtracting Polynomials WORKSHEET

Unit 6

NAME: _____

Find the sum or difference:

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

2) $(3a + 2b - 7c) + (6b - 4a + 9c)$

3) $(5y^2 - 2xy + 6x^2 - 3x + 7y - 9) + (3x^2 - 4x + 5) - (5y^2 - 3y + 6)$

Word Problems:

1) Bob mowed $(2x^2 + 5x - 3)$ yards on Monday, $(4x - 7)$ yards on Tuesday, and $(3x^2 + 10)$ yards on Wednesday.

a. How many yards did he mow in the three days?

b. If Bob mowed $14x^2 + 12x - 3$ yards total for the entire week, how many yards did he mow during the rest of the week?

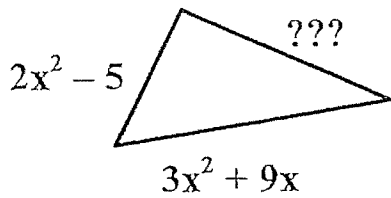
2) Molly has $(4x + 10)$ dollars and Ron has $(-5x + 20)$ dollars.

a. How much money do they have altogether?

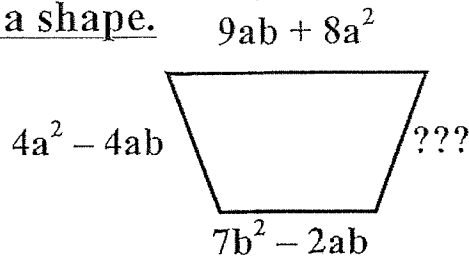
b. How much more money does Molly have than Ron?

3) Ross has $(8x - 5)$ tickets for Chuck E Cheese. He is going to play today and wants to buy a prize that is $(15x + 1)$ tickets. How many tickets must he win to have enough tickets to buy the prize?

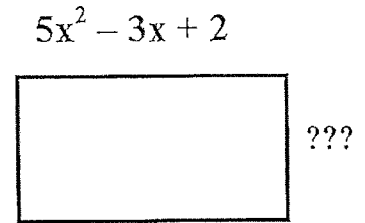
Find the missing side of a shape.



Perimeter
 $5x^2 + 7x + 12$



Perimeter
 $9b^2 - 2ab + 12a^2$



Perimeter
 $14x^2 + 4x - 8$

- 4) The measure of the perimeter of a triangle is $37s + 42$. It is known that two of the sides of the triangle have measures of $14s + 16$ and $10s + 20$. Find the length of the third side.
-
- 5) A triangle has a perimeter of $10a + 3b + 12$ and has sides of length $3a + 8$ and $5a + b$, what is the length of the third side?
- 6) For a rectangle with length of $3x + 4$ and perimeter of $10x + 18$, what is the width of the rectangle?
- 7) A rectangle has a perimeter of $12y^2 - 2y + 18$ and has a width of $4y^2 - y + 6$. What is the length of the rectangle?

POLYNOMIALS: Multiplication of Monomial and Polynomial
DISTRIBUTIVE PROPERTY REVIEW

1) $-4(2 - 6x)$

2) $3(5p + q - 3r)$

3) $-2(-x - 7y)$

SIMPLIFYING PRACTICE PROBLEMS:

1) $(4x + 7x)3$

2) $12z - 5z + 9z^2$

3) $-7(-6m + 11m)$

4) $4(11 - 3x)$

5) $-5(5a - 3b - 6)$

6) $-2(x^2 - 8x + 3x^3 - 6)$

7) $9x - 4(6 - 3x)$

8) $5(3b - 2a) - 7b$

9) $12 + 3(7x + 2)$

10) $6(4y + 3z) - 11z$

11) $5 + 2(4m - 7n) + 9n$

12) $12 - 7(3 - 5r) + 8r$