

Name: _____ Date: _____

Interpret Language in Math Expressions - NOTES

Definitions:

Vocabulary	Definition	Examples
Algebraic Expression		
Variable		
Term		
Like Terms		
Coefficient		
Exponent		
Base		
Constant		
Factors		
Order of Operations		

Translations: Fill in the appropriate words for each math operation.

Half	Decreased	Take away	Double
Plus	Twice	Increased	Add
Triple	Less Than	Cubed	Times
More Than	(swaps the order)	Minus	Together
Difference	Raised to a power	Quotient	Square
To the power of		Product	
Sum		Divide by	

Addition- (6 words)

Subtraction- (5 words)

Division- (3 words)

Multiplication- (5 words)

Exponents- (4 words)

+	x
1. The <u>sum</u> of a <u>number</u> and <u>10</u> $x + 10$	2. The <u>product</u> of 9 and x square $9x^2$
3. 9 <u>less than</u> g to the fourth power $g^4 - 9$ *Flip order	4. $8 + 3x$ eight more than three times a number

10 less than 12

$$12 - 10$$

2!

Solve each problem below. Choose the correct answer and put the corresponding letter in the blanks at the bottom.

<p>1. How many terms does the following expression have? $xy^2 + 3xy + 2y - 8$</p> <p>I 2 R 3 E 4 N 5</p>	<p>2. Identify the coefficient of the following expression: $-3yx^2$</p> <p>M -1 R -3 P y S x^2</p>
<p>3. Interpret the algebraic expression: The sum of a number squared and 10.</p> <p>I $2x + 10$ L $x^2 + 10$ S $2x - 10$ A $x^2 - 10$</p>	<p>4. Which of the following expressions has 3 terms?</p> <p>D $3x - 7$ R $y^3 + 3y^2 - 4y + 3$ P $m^3 + 1$ S $4p^2 + 12p - 10$</p>
<p>5. Which of the following expressions has a constant of 7?</p> <p>A $6y - 7$ G $4y + 7$ O $7y - 5$ L $-7y + 8$</p>	<p>6. Interpret the algebraic expression: Madeline has six beaded bracelets. She buys two more each month.</p> <p>O $2x + 6$ R $6x + 2$ P $x^2 + 6$ K $2x + 6y$</p>
<p>7. Choose the expression with three terms, a constant of 5, and one term has a coefficient of -4.</p> <p>I $-4xy + 5$ A $2x^3 - 4x + 5$ T $5x^2 + 4x - 3$ S $-4x^3 + 5x - 4$</p>	<p>8. Interpret the algebraic expression: The product of 4, π, and a number decreased by 6.</p> <p>B $4\pi x - 6$ R $4\pi - 6x$ P $4 + \pi + x - 6$ S $6 - 4\pi x$</p>

What do you call friends who LOVE math?!

7

3

5

1

8

2

6

4

3

15

Date: _____

Identifying Parts of Easy & Complicated Expressions Practice

Sara and two friends had dinner at a Spanish tapas restaurant that charges \$6 per tapa, or appetizer. The three of them shared several tapas. The total bill included taxes of \$4.32.

1. What was the cost of each tapa without including taxes?
2. What variable can be used to represent the number of tapas ordered?
3. What algebraic expression can be used to represent the cost of the tapas at \$6 each, not including taxes?
4. What algebraic expression can be used to represent the cost of the tapas ordered including taxes?
5. How many terms does the expression from question 4 include?
6. What are the terms?
7. What are the coefficients of each term? What is the constant?

Andre purchases 10 cans of tennis balls from an online store and received a 25% discount. Shipping cost \$5.99.

8. What algebraic expression can be used to represent the total cost of tennis balls purchased, if x represents the cost of each can?
9. What algebraic expression can be used to represent the total cost of tennis balls purchases that includes the 25% discount?
10. What algebraic expression can be used to represent the cost of the cans of tennis balls ordered with the 25% discount and including shipping?
11. How many terms does the expression from question 10 include?
12. List the terms.
13. What are the coefficients of each term? What is the constant?

Name: _____ Date: _____

Identifying Parts of Expressions Homework

1. Identify each term, coefficient, and constant in $5x^2 + 3x + 12$.
2. Write an expression with 4 terms, containing the coefficients 3, 6, and 9.
3. Addie agrees to buy a 6-month package deal of monthly gym passes, and in turn receives a 15% discount. Write an expression to represent the total cost of the monthly passes with the discount, if x represents the cost of each monthly pass.
4. A smartphone is on sale for 25% off of its list price. The shipping cost is \$10. What expression can be used to represent the total cost of the smartphone? Let x represent the list price of the phone. Identify each term, coefficient, constant, and factor of the expression described.
5. Allie and some friends went to a movie. Their total cost was \$30.24, which included taxes of \$2.24. Write an algebraic expression to represent the price of each movie ticket, not including taxes. Let x represent the number of Nadia's friends that went to the movies.
6. Stephanie wants to buy some purses that are on sale for 30% off the original price of \$120. The shipping cost is \$15. Write an algebraic expression to represent the total cost of the purses. Let x represent the number of purses she is buying.

Translations

Translate each verbal expression to an algebraic expression.

6. Eight more than 3 times a number _____
7. The difference of 10 and a number _____
8. The quotient of 12 and a number _____
9. 15 less than twice a number _____
10. Three-fourths the square of a number _____
11. The product of 5 and the cube of a number increased by the difference of 6 and x

12. Half the sum of x and y decreased by one-third of y _____

Intro to Polynomial Notes

Definition:

Classification by Terms:

Polynomials

Poly	Degree	Name
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

Non-Examples

Notation

- Standard Form: _____ power to _____ power.
- Leading Coefficient: The coefficient of the _____ term when the polynomial is in _____ form.
- Like Terms: Must be _____ the same. (same variable raised to the same power).

Combining Polynomials

$$(5p^2 - 3) + (2p^2 - 3p^3)$$

$$(4 + 2n^3) + (5n^3 + 2)$$

$$(a^3 - 2a^2) - (3a^2 - 4a^3)$$

$$(4r^3 + 3r^4) - (r^4 - 5r^3)$$



Adding and Subtracting Polynomials

Date _____ Period _____

Simplify each expression.

1) $(5p^2 - 3) + (2p^2 - 3p^3)$

2) $(a^3 - 2a^2) - (3a^2 - 4a^3)$

3) $(4 + 2n^3) + (5n^3 + 2)$

4) $(4n - 3n^3) - (3n^3 + 4n)$

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

6) $(4r^3 + 3r^4) - (r^4 - 5r^3)$

7) $(5a + 4) - (5a + 3)$

8) $(3x^4 - 3x) - (3x - 3x^4)$

9) $(-4k^4 + 14 + 3k^2) + (-3k^4 - 14k^2 - 8)$

10) $(3 - 6n^5 - 8n^4) - (-6n^4 - 3n - 8n^5)$

11) $(12a^5 - 6a - 10a^3) - (10a - 2a^5 - 14a^4)$

12) $(8n - 3n^4 + 10n^2) - (3n^2 + 11n^4 - 7)$

13) $(-x^4 + 13x^5 + 6x^3) + (6x^3 + 5x^5 + 7x^4)$

14) $(9r^3 + 5r^2 + 11r) + (-2r^3 + 9r - 8r^2)$

15) $(13n^2 + 11n - 2n^4) + (-13n^2 - 3n - 6n^4)$

16) $(-7x^5 + 14 - 2x) + (10x^4 + 7x + 5x^5)$

17) $(7 - 13x^3 - 11x) - (2x^3 + 8 - 4x^5)$

18) $(13a^2 - 6a^5 - 2a) - (-10a^2 - 11a^5 + 9a)$

19) $(3v^5 + 8v^3 - 10v^2) - (-12v^5 + 4v^3 + 14v^2)$

20) $(8b^3 - 6 + 3b^4) - (b^4 - 7b^3 - 3)$

21) $(k^4 - 3 - 3k^3) + (-5k^4 + 6k^3 - 8k^5)$

22) $(-10k^2 + 7k + 6k^4) + (-14 - 4k^4 - 14k)$

23) $(-7n^2 + 8n - 4) - (-11n + 2 - 14n^2)$

24) $(14p^4 + 11p^2 - 9p^5) - (-14 + 5p^5 - 11p^2)$

25) $(8k + k^2 - 6) - (-10k + 7 - 2k^2)$

26) $(-9v^2 - 8u) + (-2uv - 2u^2 + v^2) + (-v^2 + 4uv)$

27) $(4x^2 + 7x^3y^2) - (-6x^2 - 7x^3y^2 - 4x) - (10x + 9x^2)$

28) $(-5u^3v^4 + 9u) + (-5u^3v^4 - 8u + 8u^2v^2) + (-8u^4v^2 + 8u^3v^4)$

29) $(-9xy^3 - 9x^4y^3) + (3xy^3 + 7y^4 - 8x^4y^4) + (3x^4y^3 + 2xy^3)$

30) $(y^3 - 7x^4y^4) + (-10x^4y^3 + 6y^3 + 4x^4y^4) - (x^4y^3 + 6x^4y^4)$

Multiplying Polynomials: Lets Compare

Distributive Property

$$5(x+2) = 5 \cdot x + 5 \cdot 2$$

$$(5x)(3x+6) = 5x \cdot 3x + 5x \cdot 6$$

$$(5)(3x^2+2x+6) = 5 \cdot 3x^2 + 5 \cdot 2x + 5 \cdot 6$$

With Binomials!

Distributive Property

$$(x+2)(x+4) = x \cdot (x+4) + 2(x+4)$$

$$= x \cdot x + x \cdot 4 + 2 \cdot x + 2 \cdot 4 \text{ distribute}$$

$$= x^2 + 4x + 2x + 8 \text{ combine like terms}$$

$$= x^2 + 6x + 8 \text{ Answer}$$

Multiplying Binomials/Polynomials

FOIL

F- First $(2x+3)(3x+4)$

O- Outside

I- Inside

L- Last

Aug 12-7:23 AM

Sep 30-9:22 AM

1. $(n-8)(3n+8)$
2. $(7x-5)(2x-8)$
3. $(2b-7)(5b+1)$
4. $(5x+7)(x-7)$

Sep 30-9:33 AM

Multiplying Polynomials

Find each product.

1) $6v(2v + 3)$

2) $7(-5v - 8)$

3) $2x(-2x - 3)$

4) $-4(v + 1)$

5) $(2n + 2)(6n + 1)$

6) $(4n + 1)(2n + 6)$

7) $(x - 3)(6x - 2)$

8) $(8p - 2)(6p + 2)$

9) $(6p + 8)(5p - 8)$

10) $(3m - 1)(8m + 7)$

11) $(2a - 1)(8a - 5)$

12) $(5n + 6)(5n - 5)$

13) $(4p-1)^2$

14) $(7x-6)(5x+6)$

15) $(6n+3)(6n-4)$

16) $(8n+1)(6n-3)$

17) $(6k+5)(5k+5)$

18) $(3x-4)(4x+3)$

19) $(4a+2)(6a^2-a+2)$

20) $(7k-3)(k^2-2k+7)$

21) $(7r^2-6r-6)(2r-4)$

22) $(n^2+6n-4)(2n-4)$

23) $(6n^2-6n-5)(7n^2+6n-5)$

Special Case Binomials: Complete the following, see a pattern?

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

3.) $(4x+1)^2$ 4.) $(6x-2)^2$

$(a+b)^2$	Perfect Square
$(a-b)^2$	Perfect Square
$(a+b)(a-b)$	Difference of Squares

Aug 15-6:23 AM

3. Add Times Subtract

$$(a+b)(a-b) = \dots ?$$

The result:

$$(a+b)(a-b) = a^2 - b^2$$

$$(2x+1)(2x-1)$$

$$4x^2 - 1$$

Also called:
DIFFERENCE OF
SQUARES

Aug 6-8:42 PM

1. Multiplying a Binomial by Itself

$$(a+b)^2 = (a+b)(a+b)$$

The result:

$$(a+b)^2 = a^2 + 2ab + b^2$$

$$\begin{array}{c} \text{First term squared} \quad (4x+1)^2 \quad \text{Second term squared} \\ \swarrow \quad \quad \quad \searrow \\ 16x^2 + 8x + 1 \\ \uparrow \\ \text{Twice the product} \\ \text{of first and second term} \\ 2(4)(1) \end{array}$$

Aug 6-8:32 PM

2. Subtract Times Subtract

$$(a-b)^2 = (a-b)(a-b)$$

The result:

$$(a-b)^2 = a^2 - 2ab + b^2$$

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

$$36x^2 - 24x + 4$$

Aug 6-8:39 PM

Multiplying Special Case Polynomials

Date _____ Period _____

Find each product.

1) $(x+5)(x-5)$

2) $(n-1)(n+1)$

3) $(p-1)^2$

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

5) $(x-4)^2$

6) $(n+3)^2$

7) $(x-5)(x+5)$

8) $(n-5)^2$

9) $(2k^2+1)^2$

10) $(8a^2+4)(8a^2-4)$

11) $(2+5n^2)^2$

12) $(3x-7)(3x+7)$

Multiplying Polynomials

Date _____ Period _____

Find each product.

1) $(4n^2 + 5)^2$

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

3) $(8n - 1)^2$

4) $(5v - 5)(5v + 5)$

5) $(5x - 1)(8x + 1)$

6) $(4r + 1)(2r - 2)$

7) $(2b - 5)(5b^2 + b + 7)$

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

Combining Polynomials- Jigsaw

1. A floor game uses a grid represented by two dark gray spaces and two white spaces. If each floor grid has four squares, and the side of each square is represented by $3a$, what expression represents the area of the entire floor grid?



2. The lengths of the correct paths through a maze are represented by $3x^2 + 6$, $2x^2 - x$, $7x + 2$, $5x^2 - 3$, $-4x^2 + 1$, and $8x + 3$. Write an expression that represents the length of the correct path through the maze.
3. While Stacey loves the wild rabbits in her back yard, she would like to keep the little critters out of her vegetable garden. If her vegetable garden is a rectangle whose width is represented by $5x^2 + 3x$ and whose length is represented by $2x^2 + 4$, write an expression that represents the amount of fencing needed to enclose the veggie garden.
4. In the year 1995, the average cost of a cellphone could be modeled by the expression $-10t^2 + 1600$ where t is the number of years since 1995. By the year 2009 the average cost had changed, so it could be modeled by the expression $-18t^2 + 800$. Find the difference in the average costs for a cellphone between 2009 and 1995.
5. If the length of a rectangle in terms of x is $5x^2 + 2x + 1$, and its width is $3x + 1$, what is the perimeter of this rectangle?
6. Bob mowed $2x^2 + 5x - 3$ yards on Monday, $4x - 7$ yards on Tuesday, and $3x^2 + 10$ yards on Wednesday. How many yards did he mow in the three days?
7. Molly has $4x + 10$ dollars and Ron has $-5x + 20$ dollars.
- How much money do they have altogether?
 - How much more money does Molly have than Ron?