



Moore Catholic High School

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To the Class of 2023

I would like to take this opportunity to welcome you to Moore Catholic High School. The Math Department has been working diligently to ensure that your program of studies over the next few years will enable you to excel in all aspects of mathematics. It is also our intention that you will be well-prepared to achieve on the college level.

Attached you will find a list of vocabulary terms and properties which you need to be familiar with before we start Algebra I Common Core. You will also find some math problems which are to be done on loose-leaf with all work shown. You will be tested on both the vocabulary and the types of problems given in the packet during your first week of school.

Congratulations on your acceptance to Moore Catholic High School. With hard work and a desire to achieve, I am certain that your time at Moore will be a rewarding experience. I look forward to working with you in the classroom.

Have a happy and healthy summer, and see you in September.

Sincerely,

Mrs. Camille Horihan
Coordinator of Mathematics

Moore Catholic High School

Math Department

Algebra Common Core Vocabulary

The following is a list of terms and properties which are necessary for success in an Integrated Algebra class. You will be tested on these terms during your first week of classes:

abscissa – x-coordinate of an ordered pair

absolute value – the distance from 0 to any number n on the number line. The symbol for absolute value is: $| \quad |$

acute angle – an angle whose measure is greater than 0° but less than 90°

adjacent angles – angles that share a common vertex and a common side but do not share any interior points

angle – a figure formed by two rays with a common endpoint

associative property – a property of real numbers which states the sum and product of numbers or variables is the same regardless of how they are grouped

axis – horizontal or vertical line used to locate a point in the coordinate system

base – a number, variable or expression that is raised to a power

binomial – an algebraic expression which contains two terms

circle – the set of all point that are equally distant from a fixed point called the center

circumference - the distance around a circle

coefficient – the numerical factor of a term. In $-3x^2y$, -3 is the coefficient

commutative property – a property of real numbers which states that the sum or product of two terms is the same no matter what order they are in

coordinates – an ordered pair which represents a point on the coordinate plane

counting numbers - also called the **natural numbers**, $\{1, 2, 3, 4, 5, \dots\}$

cylinder – a solid figure which contains two congruent bases which are circles

decagon – a ten sided polygon

difference – the answer to a subtraction problem

distributive property – a property of real numbers that states that the product of a number and the sum or difference of two numbers is the same as the sum or difference of their products

domain – set of all first elements in a function, the x-values when working with equations.

element – one object of a set

equation – a mathematical sentence which states that two expressions are equal

exponent – a number that tells how many times the base is used as a factor. For example, in the expression 2^4 , 2 is the base, and 4 is the exponent which indicates 4 factors of 2, i.e. $2 \times 2 \times 2 \times 2 = 16$.

expression – a mathematical phrase which can include numbers, variables and operations

factor – an expression that is a divisor of another expression

function – a rule that assigns each member in a domain to a unique number in the range

geometry – a branch of mathematics that defines and relates the basic properties and measurements of line segments and angles

greatest common factor (GCF) – the greatest number or expression that is a factor of two or more numbers or expressions

hexagon – a six sided polygon

hypotenuse – the longest side of a right triangle. It is opposite the right angle.

identity element – the element of a set which when used in operation with other elements of the same set will give back the same element. In addition, 0 is the identity element since $n + 0 = n$ and in multiplication, 1 is the identity element since $1 \times n = n$.

inequality – a mathematical sentence which contains one of the following symbols: $<$, \leq , $>$, \geq , \neq

integers - the set of numbers which contains the counting numbers, their opposites and zero

$$\{ \dots -3, -2, -1, 0, 1, 2, 3, \dots \}$$

intersection - elements that two or more sets have in common

inverse operation - an operation that undoes another operation. Addition and subtraction are inverse operations as well as multiplication and division.

irrational number - any number that cannot be written in $\frac{a}{b}$ form. They are non-repeating, non-terminating decimals.

isosceles triangle - a triangle with two congruent sides. The base angles are also congruent.

line - set of points

linear equation - a first degree equation

linear inequality - a first degree inequality

literal equation - an equation which contains more than one variable

measure of central tendency - a statistic that indicates the center of a set of data. Three examples of measures of central tendency are the mean, median and mode.

mean - an average. It is found by adding data values and dividing that sum by the number of values. The symbol for the mean is \bar{x} .

median - indicates the middle of a set of data when arranged in ascending or descending order. If there is no middle number, the median is the average of the two middle numbers.

mode - the value that occurs most frequently in the data

monomial - a polynomial with one term. It can be a number, a variable or the product of numbers and variables.

multiplication property of zero - the product of zero and any number equals 0

nonagon - a nine sided polygon

null set - a set with no elements, also called the empty set. It can be symbolized by $\{ \}$

octagon - an eight sided polygon

ordered pair - two numbers used to identify a point on a set of axes. They are represented by (x, y) .

ordinate - the y-value in an ordered pair

parallel lines - two or more lines on the same plane that do not intersect

parallelogram - a quadrilateral in which both pairs of opposite sides are parallel

pentagon - a five sided polygon

percent - a ratio of a number to 100

perimeter - the sum of all the sides of a polygon

plane - set of points which suggest a flat surface

polygon - a closed figure which is made up of line segments

polynomial - a monomial or the sum or difference of monomials

product - the answer to a multiplication problem

proportion - an equation in which two fractions are equal. It is solved by cross multiplying.

Pythagorean Theorem - a statement which says that the square of the hypotenuse of a right triangle is equal to the sum of the squares of its legs. If a and b are the legs and c is the hypotenuse, then $a^2 + b^2 = c^2$.

quadratic equation - an equation which can be written in the form $ax^2 + bx + c = 0$, where a , b and c are real and $a \neq 0$

quadrilateral - a four sided polygon

quotient - the answer to a division problem

radical - the root of a quantity symbolized by $\sqrt{\quad}$

radicand - the expression under the radical sign. In $\sqrt{7}$, 7 is the radicand.

range - set of all second elements in a function, the y -values when working with equations.

ratio - a comparison between two quantities.

rational number - any number that can be written in the form $\frac{a}{b}$ where a and b are real and $b \neq 0$. It is a terminating or a repeating decimal.

ray - part of a line with one endpoint

real numbers - the set of numbers which contains all the rational numbers and all the irrational numbers

rectangle - a parallelogram which contains a right angle. It is a quadrilateral with four right angles.

rectangular solid - a prism whose faces are all rectangles

regular polygon - a polygon in which all sides are equal in length (equilateral) and all angles are equal in measure (equiangular).

rhombus - a parallelogram with congruent consecutive sides, a quadrilateral with four congruent sides.

right angle - an angle whose measure is 90°

right triangle - a triangle with one right angle

scientific notation - a method used to write very large or very small numbers. In scientific notation, numbers are written in the form $a \times 10^n$ where $1 \leq a < 10$ and n is an integer.

set - a collection of objects

solution set - answers to a mathematical problem

square - a rectangle with congruent sides

straight line - set of point which extends infinitely in both directions

subset - a smaller part of a given set. It can also be the empty or null set.

sum - the answer to an addition problem

trapezoid - a quadrilateral with only one pair of opposite sides parallel

triangle - a three sided polygon

trinomial - a polynomial with three terms

union - when the elements of two or more sets are put together to form a new set

variable - a letter or symbol which represents one or more numbers

vertex of an angle - point where two rays intersect to form an angle

x-axis - the horizontal number line on the Cartesian plane

x-coordinate - the first coordinate in any ordered pair. It is also called the abscissa.

x-intercept - the point at which a graph intersects the x-axis. The y-value for this point is 0.

y-axis - the vertical number line on the Cartesian plane

y-coordinate - the second coordinate in any ordered pair. It is also called the ordinate.

y-intercept - the point at which a graph intersects the y-axis. The x-value for this point is 0.

Properties of Mathematics

Commutative Property of Addition

$$a + b = b + a$$

Associative Property of Addition

$$a + (b + c) = (a + b) + c$$

Identity Property of Addition

$$a + 0 = a$$

Additive Inverse Property

$$a + -a = 0$$

Distributive Property

$$a(b + c) = ab + ac$$

$$a(b - c) = ab - ac$$

Commutative Property of Multiplication

$$ab = ba$$

Associative Property of Multiplication

$$a \times (b \times c) = (a \times b) \times c$$

Identity Property of Multiplication

$$a \times 1 = a$$

Multiplicative Inverse Property

$$a \times \frac{1}{a} = 1$$

Multiplication Property of Zero

$$a \times 0 = 0$$

Math Summer Assignment for Incoming Freshmen

This assignment is to be done on looseleaf and all work is to be shown. It will be collected during your first math class at Moore Catholic High School. You will also be tested on this material during the first week of classes.

Part I: For each of the following, perform the indicated operation and be sure to express the results in simplest form when possible. Be sure to show all work.

- | | |
|-----------------------|--|
| 1. $.02 + 1.19$ | 13. $\frac{1}{3} - \frac{1}{5}$ |
| 2. $-52 + 70$ | 14. $\frac{2}{7} + \frac{3}{5}$ |
| 3. $46.2 \times .011$ | 15. $\frac{8}{5} - \frac{3}{10}$ |
| 4. $84.268 \div .05$ | 16. $\frac{5}{6} - \frac{6}{7}$ |
| 5. $-56 + 62$ | 17. $\frac{4}{7} \times \frac{9}{2}$ |
| 6. $-29 + -73$ | 18. $\frac{12}{5} \times \frac{10}{6}$ |
| 7. $18 - 49$ | 19. $1\frac{1}{4} \times 3\frac{1}{8}$ |
| 8. $-33 - 15$ | 20. $\frac{7}{10} \div \frac{14}{15}$ |
| 9. $(-10)(19)(-2)$ | 21. $3\frac{1}{3} \div 8\frac{2}{3}$ |
| 10. $(-16)(-3.55)$ | 22. $10 - 11\frac{1}{3}$ |
| 11. $92 \div (-6)$ | 23. $7\frac{2}{5} - 10$ |
| 12. $-98 \div (-2.5)$ | 24. $4 \div \frac{1}{4}$ |

Part II: Answer the following questions. Be sure to write the formula, show appropriate substitutions and show all steps needed to solve completely.

1. Find the area of a circle to the nearest tenth, if the diameter = 10 in.
2. Find the area of a rectangle with $b = 18$ ft. and height = 2 ft.
3. Find the area of a square with one side = 23 cm.
4. Find the area of a triangle with base = 24 ft and height = 3 ft
5. Find the area of a rhombus with diagonals that measure 24 cm and 32 cm
6. Find the area of a parallelogram with base = 11 in and height = 12 in
7. Find the circumference of a circle to the nearest integer, if the radius is 30cm.
8. Find the volume of a sphere, to the nearest tenth, if the radius 12 cm

Part III: Solve algebraically for x and check your result. Be sure to show all work.

- | | |
|------------------------|------------------------------|
| 1. $x + 13 = 1$ | 8. $2x - 15 = -9$ |
| 2. $y - 7 = 99$ | 9. $7 - 4x = 19$ |
| 3. $7.2 + x = 19.5$ | 10. $.5x + 3 = 13$ |
| 4. $-2a = 10$ | 11. $9 - x = 17$ |
| 5. $\frac{1}{2} a = 3$ | 12. $-5y = 125$ |
| 6. $\frac{x}{4} = 12$ | 13. $10 + \frac{x}{5} = -20$ |
| 7. $2x + 3 = 19$ | 14. $\frac{1}{2} x - 1 = 15$ |

Part IV: Solve each of the following percent problems. Be sure to show all work.

1. What is 20% of 16?
2. What percent of 100 is 25?
3. 46 is what percent of 107?
4. 17% of what is 156?
5. Find 1.5% of 70.
6. What percent of 75 is 25?
7. 198 is 99% of what?
8. What is 40% of 420.

Part V: Round each of the following.

1. 75.89 to the nearest whole number
2. 867.547 to the nearest tenth
3. 1.6729 to the nearest hundredth
4. 535.345 to the nearest ten
5. 13.67848 to the nearest ten-thousandth
6. 537.821 to the nearest whole number
7. 213.392 to the nearest tenth
8. 345.834 to the nearest hundredth
9. 6540.432 to the nearest hundred
10. 41623.379 to the nearest hundredth

PART VI: Write an equation with the variable x for the following word problems. Solve the equation for x algebraically.

1. Five more than a number is 14.
2. Six less than twice a number is -60.
3. A number decreased by 4 is -15.
4. The quotient of a number and 2 is -5.
5. Four more than twice a number is 44.

PART VII: Name the property illustrated.

1. $5a = a(5)$
2. $2(x + y) = 2x + 2y$
3. $-x + x = 0$
4. $(3t)(0) = 0$
5. $a + (b + 3) = (a + b) + 3$
6. $4\left(\frac{1}{4}\right) = 1$
7. $2 + -2 = 0$
8. $4+a = a + 4$