

Moore Catholic High School

Math Department

GEOMETRY VOCABULARY

The following is a list of terms and properties which are necessary for success in a Geometry class. You will be tested on the summer assignment the first week and these terms will help you to succeed.

abscissa - The horizontal or x -coordinate of a two-dimensional coordinate system.

absolute value - The distance from 0 to a number n on a number line. The absolute value of a number n is indicated by $|n|$.

Example: $|-3| = 3$, $|+3| = 3$

acute angle - An angle whose measure is greater than 0° and less than 90° .

acute triangle - A triangle that contains three acute angles.

adjacent angles - Two coplanar angles that share a common vertex and a common side but have no common interior points.

alternate interior angles - Any two nonadjacent angles that lie on opposite sides of a transversal and that are interior to the lines.

altitude - height of a geometric figure. It is drawn perpendicular to the base.

angle - A geometric figure formed by two rays that have a common endpoint.

base - Any side or face of a geometric figure to which an altitude is drawn.

chord - A line segment joining any two points on a circle. The diameter is the largest chord of a circle.

circle - The set of all points (or locus of points) in a plane that are a fixed distance, (called the radius) from a fixed point, (called the center).

circumference - The length of or distance around a circle. The formula for circumference is:

$$C = 2\pi r = \pi d$$

complementary angles - Two angles the sum of whose measures is 90 degrees.

congruent - Having the same size and shape.

cube - A 3-dimensional figure with six square faces.

decagon - A polygon with ten sides.

diagonal - A line segment that connects two non-consecutive vertices of a polygon.

diameter - A chord of the circle that passes through the center of the circle.

equiangular - A polygon with all interior angles congruent.

equilateral polygon - A polygon with all sides congruent.

equilateral triangle - A triangle with three congruent sides. Each angle is 60° .

geometry - Branch of mathematics that deals with the properties, measurement, and relationships of points, lines, angles, surfaces, and solids.

hypotenuse - The side of a right triangle opposite the right angle; the longest side of a right triangle.

interior - The set of all points inside a geometric figure.

isosceles trapezoid - A trapezoid in which the non-parallel sides are congruent.

isosceles triangle - A triangle that has at least two congruent sides.

linear pair of angles - Any two adjacent angles whose non-common sides form a line.

major arc - In a circle, any arc whose length is greater than the length of a semicircle.

minor arc - In a circle, any arc whose length is less than the length of a semicircle.

obtuse angle - An angle whose measure is greater than 90 degrees and less than 180 degrees.

obtuse triangle - A triangle with one obtuse angle.

origin The point in the Cartesian coordinate plane at which the horizontal and vertical axes intersect, designated by the ordered pair (0,0).

parallel lines - Two or more coplanar lines that do not intersect.

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

perimeter - The sum of the lengths of all the sides of any polygon.

perpendicular lines - Two lines that intersect to form right angles.

plane - An undefined term in geometry usually visualized as a flat surface with no thickness that extends indefinitely in two dimensions.

point-slope equation of a line - The equation of a line formed using its slope and the coordinates of a point on the line, where m is the slope of the line and (x_1, y_1) are the coordinates of the given point. $y - y_1 = m(x - x_1)$

polygon A closed plane figure formed by three or more line segments that meet only at their endpoints.

Pythagorean Theorem - In a right triangle the sum of the squares of the lengths of the two legs is equal to the square of the length of the hypotenuse; if a and b are the lengths of the legs and c is the length of the hypotenuse, then $a^2 + b^2 = c^2$.

quadrilateral - A polygon with 4 sides..

radius - A line segment drawn from the center of a circle to a point on the circle.

regular polygon - A polygon which is both equilateral and equiangular.

right angle - An angle formed by two perpendicular lines, the measure of which is 90° .

right triangle - A triangle with one right angle.

scalene triangle - A triangle with no congruent sides.

semi-circle - Either of the arcs of a circle determined by the endpoints of a diameter. Half a circle.

slope - The measure of the steepness of a line; the ratio of vertical change to horizontal change; if point P is (x_1, y_1) and point Q is (x_2, y_2) the slope of $PQ = \frac{\Delta y}{\Delta x} = \frac{y_2 - y_1}{x_2 - x_1}$

slope - intercept equation of a line The equation of a line formed using its slope and its y-intercept. If the coordinates of the y-intercept of the line are $(0, b)$ and the slope is m , then the equation of the line is $y = mx + b$.

supplementary angles - Two angles the sum of whose measures is 180 degrees.

surface area - The sum of the areas of all the faces or curved surfaces of a solid figure.

transversal - A line that intersects two (or more) other lines.

vertex of an angle - The point of intersection of the two rays that form the sides of the angle.

vertical angles - The two nonadjacent angles formed when two lines intersect.

volume - A measure of the number of cubic units needed to fill the space inside a solid figure.

x-intercept - The point at which the graph of a relation intercepts the x -axis. The ordered pair for this point has a value of $y = 0$.

y-intercept - The point at which a graph of a relation intercepts the y -axis. The ordered pair for this point has a value of $x = 0$.

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

$$a \times 0 = 0$$

SUMMER ASSIGNMENT FOR GEOMETRY COMMON CORE 2022

This assignment is to be done on loose-leaf 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 ONE: Solve the following equations for the variable. Be sure to show all work.

1. $3(x - 1) = 18$

7. $1/5x = 1$

2. $1/4 x = -20$

8. $.30 x = 3$

3. $6x + x = 84$

9. $5x - (6x - 1) = 3$

4. $7x + 6 = 28 + 5x - 5$

10. $7(x + 2) = 6 + 4(2x - 1)$

5. $1/2 x - 1 = 1$

11. $3(x - 2) - x = 1$

6. $1/4 (12x - 16) = 21$

12. $1/4 x = 13$

PART TWO: Answer each of the following questions. Be sure to show all work including formulas, substitution into the formulas and solving procedures.

1. If the legs of a right triangle are 5 and 12, express the length of the hypotenuse.
2. Find in terms of π the area of a circle with diameter 12 m.
2. If the perimeter of a square is 48 inches, find the area of the square
4. Find the equation of the line where the slope is $\frac{1}{2}$ and the y-intercept is 18. Write your answer in point slope form.
5. If the base of a parallelogram is 3 centimeters and the height is 20 centimeters, find the area of the parallelogram.
6. Find in point slope form of the line whose slope is $-\frac{1}{4}$ and passing through (12, -11)
7. If the area of a triangle is 60 square centimeters and the base is 2 centimeters find the height of the triangle.
8. Find the volume of a sphere to the nearest tenth that has a radius 9 inches.
9. Find the volume of a cone that has a diameter of 10 inches and height of 2 inches in terms of π .
10. In triangle ABC the $m\angle A = 36$ degrees and the measure of $\angle C = 80$ degrees. Name the sides in descending order.
11. The measures of two complementary angles are in a ratio of 1:8. Find the measure of both angles.
12. The measures of three angles of a triangle are $3x$, $x + 30$ and $x + 40$. Find the measure of all three angles.
13. Find the equation of the line passing through the points (3, 7) and (5, -1). Your answer should be in point-slope form.
14. Angle A and B are supplementary. If $m\angle A = 3y + 12$ and $m\angle B = 2y + 48$, find the value of y .
15. The measures of two vertical angles are $5y + 10$ and $2y + 16$. Find the measure of both angles.

PART THREE: Write each of the following in simplest radical form.

1. $\sqrt{300}$ 2. $3\sqrt{72}$ 3. $5\sqrt{12} - 7\sqrt{3}$ 4. $\frac{1}{2}\sqrt{200}$ 5. $\frac{1}{4}\sqrt{32}$

6. $3\sqrt{18} - \sqrt{50} + \sqrt{200}$ 7. $5\sqrt{27} - \sqrt{12}$

PART FOUR: Factor the following completely.

1. $x^2 - 11x + 30$

2. $12x + 72$

3. $x^2 - 49$

4. $6x^2 + 24x + 24$

5. $x^2 - 11x + 24$

6. $x^3 - 9x$

7. $40x^2 - 3xa$

8. $5x^2 - 25x + 30$

9. $144 - m^2$

10. $x^3 + 9x^2 - 10x$

11. $a^2 - 2a - 120$

12. $7a^4b^2 - 63a^2b^2$

13. $2y^2 + 7y - 4$

14. $x^4 - 256$

15. $x^3 - 3x^2 - 4x + 12$

PART FIVE: Use the quadratic formula to solve for x for the following examples. All radicals must be in simplest form.

1. $x(x - 2) = 24$

2. $x(x + 5) = 1$

3. $x^2 + 4x - 45 = 0$

PART SIX: Solve the following equations by factoring.

1. $x(x - 4) = 32$

2. $x^2 - 3x - 54 = 0$