**Geometry – Honor**

Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

[**Geo.M.G.GPE.B.04** - I can use algebra to prove simple geometric theorems.](https://www.beyondtextbooks.org/High_School/Math/Geometry/Standards/Geo.M.G.GPE.B.04)

**Geometric Shapes**

**Parallelogram:** One pair of opposites sides are // and congruent, 2 opposite sides are congruent, diagonals bisect each other, opposite angles are congruent, consecutive angles are supplementary.

**Square:** Parallelogram + all sides are congruent, diagonals are perpendicular, 4 vertices are 4 right angles.

**Rectangle:** Parallelogram + 4 vertices are right angles.

**Rhombus:** Parallelogram + 4 sides are congruent, diagonal are perpendicular.

**Kite:** Has two pairs of sides, each pair is made of two adjacent sides (they meet) that are equal in length, the angles are equal where the pairs meet, diagonal are perpendicular, one of the diagonals bisects) the other.

**Circle:** A simple [shape](https://en.wikipedia.org/wiki/Shape) in [Euclidean geometry](https://en.wikipedia.org/wiki/Euclidean_geometry). It is the set of all [points](https://en.wikipedia.org/wiki/Point_%28geometry%29) in a [plane](https://en.wikipedia.org/wiki/Plane_%28mathematics%29) that are at a given distance from a given point, the center.

**Triangles:** Isosceles and Equilateral

**Key words:**

**Slope:** The Slope (also called [Gradient](http://www.mathsisfun.com/gradient.html)) of a straight line shows how steep a straight line is. Divide the change in height by the change in horizontal distance.

**Distance formula:** Given the two points (*x1*, *y*1) and (*x*2, *y*2), the distance between these points is given by the formula:

![[(x_1 + x_2)/2 , (y_1 + y_2)/2]]()

**Midpoints:** The midpoint between the 2 points.

**Coordinate plane:** A Cartesian coordinate system is a [coordinate system](https://en.wikipedia.org/wiki/Coordinate_system) that specifies each [point](https://en.wikipedia.org/wiki/Point_%28geometry%29) uniquely in a [plane](https://en.wikipedia.org/wiki/Plane_%28geometry%29) by a pair of [numerical](https://en.wikipedia.org/wiki/Number) coordinates, which are the [signed](https://en.wikipedia.org/wiki/Positive_and_negative_numbers) distances to the point from two fixed [perpendicular](https://en.wikipedia.org/wiki/Perpendicular) directed lines, measured in the same [unit of length](https://en.wikipedia.org/wiki/Unit_length).

Math History: The invention of Cartesian coordinates in the 17th century by [René Descartes](https://en.wikipedia.org/wiki/Ren%C3%A9_Descartes) ([Latinized](https://en.wikipedia.org/wiki/Latinisation_%28literature%29) name: *Cartesius*) revolutionized mathematics by providing the first systematic link between [Euclidean geometry](https://en.wikipedia.org/wiki/Euclidean_geometry) and [algebra](https://en.wikipedia.org/wiki/Algebra). Using the Cartesian coordinate system, geometric shapes (such as [curves](https://en.wikipedia.org/wiki/Curve)) can be described by Cartesian equations: algebraic [equations](https://en.wikipedia.org/wiki/Equation) involving the coordinates of the points lying on the shape. For example, a circle of radius 2, centered at the origin of the plane, may be described as the set of all points whose coordinates *x* and *y* satisfy the equation *x*2 + *y*2 = 4.

**Perimeter**: Sum of all sides.

**Area:** A quantity of 2 dimensional shape or figure.

Formulas for area:

Aparallelogram = *b*$∙$*h*

Atrapezoid = $\left(\frac{base\_{1}+ base\_{2}}{2}\right)h$

Arhombus = $\frac{1}{2}$*d1*$∙$*d2*

Acircle = $πr^{2}$

Equation of a circle: x2 + y2 = r2, where the origin is the center

 (x – h)2 + (y – k)2 = r2, the center is (h, k).