Geometry: Some Definitions and Basic Information

Angle: Two straight lines drawn from the same point, and diverging from each other, form an opening called an angle. An angle can be expressed by three letters with the middle letter representing the vertex, or point of divergence. A single letter corresponding to the vertex can also express an angle, or a letter placed within the angle such as "x" or, frequently a Greek letter can serve the same purpose. The **magnitude** of an angle does not depend upon the length of the lines forming the angle, rather it depends upon the distance between them, that is, the amount of divergence separating one line from the other. The number of degrees of arc that the sides of the angle intersect, assuming the center of the arc is placed at the vertex of the angle, measures the magnitude of an angle. Angles are of three varieties: A right angle is an angle where the two lines are perpendicular, or 90º, an obtuse angle contains more than 90º and an acute angle contains less than 90º. An angle whose vertex is at the center of a circle is called a **central angle**. An angle drawn within a circle whose vertex fall on the circles circumference is called an **inscribed angle**.

Perpendicular: One line is perpendicular to another when the two angles formed by the two lines are equal in magnitude. When using the sexigesimal system of circle measurement if follows that the measure of the angles so formed would be 90º.

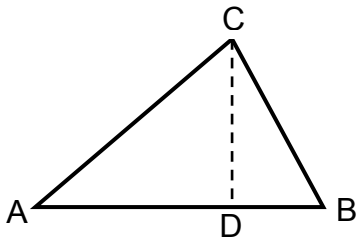
Parallel: Two lines are parallel if all perpendiculars drawn from one line to the other are equal in length. It follows that if all perpendiculars drawn from one line to another line are equal in length the two lines must be perpendicular.

Two geometric figures are said to be equal if they enclose an equal amount of space, or area. A circle and triangle, for example will be equal if the area enclosed by each is the same.

Two geometric figures are said to be **identical**, or **congruent**, if they are equal in all their respective parts, that is all angles and sides are equal in measure and they enclose exactly the same area. Two identical figures will exactly superimpose with perfect coverage of one over the other. Identical geometric figures are both the same size and the same shape.

Two geometric figures are said to be **similar** if they are of the same shape but different size, that is, all the angles of one are equal to all the corresponding angles of the other.

A **triangle** is a figure composed of three straight lines. If all three lines are the same length the triangle is said to be **equilateral**. If two sides are the same length and the third side different the triangle is called **isosceles**. If all three sides are of different length the triangle is said to be **scalene**. A triangle with a right angle is called a **right** triangle. A right triangle can be either isosceles or scalene.



It is common practice to draw a triangle with one side horizontal, as side AB in the triangle above. This side, which is below the rest of the triangle, is called its **base**. The vertex opposite the base is called the **apex** of the triangle. Also in the above triangle the side CD, drawn perpendicular to the base up to the apex, is called the **altitude**. The length of this line is frequently thought of as the height of the triangle. Of course any side of the triangle can serve as the base. That being the case a triangle can have three possible altitudes. A general definition for altitude would then be: An altitude of a triangle is a line drawn from any vertex perpendicular to the opposite side.

A **circle** can be thought of as the set (or locus) of points equidistant from a fixed point called the center. The set of points so designated is called the **circumference** of the circle. Any line connecting the center of the circle to its circumference is called a **radius** of the circle. By definition, all radii of a given circle must be equal in length. A circle can have an infinite number of radii. Any line passing through the center of a circle that is terminated by the circumference is termed a **diameter** of the circle. A diameter of a circle must necessarily be twice the length of its radius. A circle can have an infinite number of diameters.

A **quadrilateral** is any figure composed of four straight lines called its sides.

A **parallelogram** is a quadrilateral that has both pairs of opposite sides parallel.

A **rectangle** is a quadrilateral where all four angles are right angles.

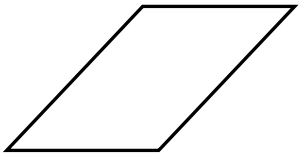
A **square** is a quadrilateral with four right angles and all four sides equal in length.

A **trapezoid** is a quadrilateral figure with one pair of opposite sides parallel. The two parallel sides are referred to as the bases of the trapezoid.

A **trapezium** is a term for any quadrilateral that has no sides parallel.

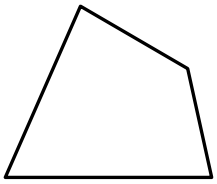
A **rhombus** is a parallelogram with two adjacent sides equal, which, by implication, means that all sides must be equal, making the figure equilateral.

All of the figures below are quadrilaterals

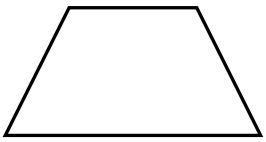


Parallelogram

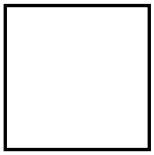
Rectangle



Trapezium



Trapezoid



Square