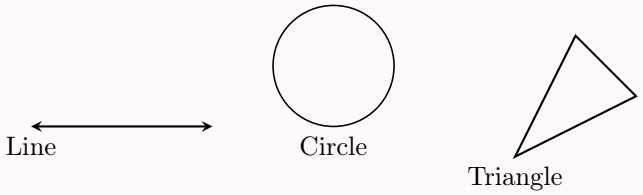
# 2D SHAPES

## A PLANE GEOMETRY

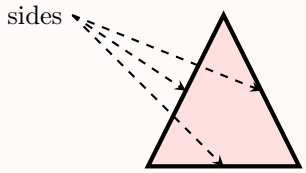
**Definition Plane Geometry**

**Plane Geometry** is the study of flat shapes that you see in pictures or on paper. These shapes include lines, circles, triangles, squares, and rectangles. We call them flat because they have length and width, but no thickness.



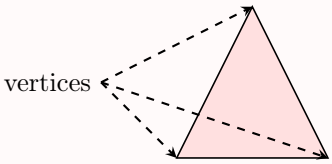

**Definition Side**

A **side** is a straight edge of a shape.




**Definition Vertex**

A **vertex** (more than one: *vertices*) is a point where two sides meet.




## B POLYGONS

**Definition Polygon**

A **polygon** is a flat, closed shape made of straight sides that do not cross each other.

**Ex:** Look at the shapes below. Decide if each one is a polygon.


*Answer:*


Yes, it is a polygon. No, it has a curved side. No, the sides cross. No, it is not closed.

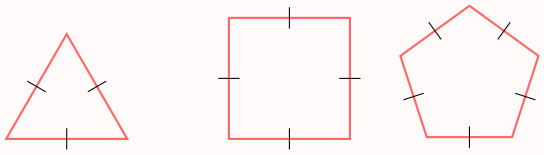
**Definition Classification of Polygons**

A **polygon** is named by the number of sides it has. Here are some common polygons:

| Triangle | Quadrilateral | Pentagon | Hexagon |
|---|---|---|---|
| 3 sides | 4 sides | 5 sides | 6 sides |

Definition **Regular Polygon**

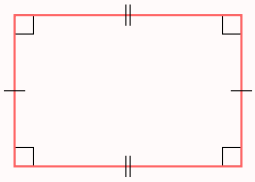
A **regular polygon** has all sides the same length and all angles the same size.



Equilateral Triangle Square Regular Pentagon

Definition **Rectangle**

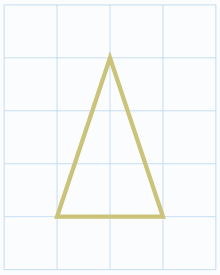
A **rectangle** is a quadrilateral (a 4-sided polygon) with four right angles. In a rectangle, opposite sides are equal in length.



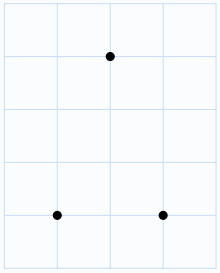
## C DRAWING SHAPES ON GRAPH PAPER

Method **Reproducing a Shape on Graph Paper**

To reproduce this shape on graph paper:



1. **Place the vertices**: Choose one vertex of the original shape as a starting point. Draw this vertex on the grid in the same place. Then count the grid squares to the right/left and up/down to place the other vertices, keeping the same moves as on the original shape.



2. **Draw the sides**: Use a ruler to join the vertices with straight line segments in the same order as on the original shape.