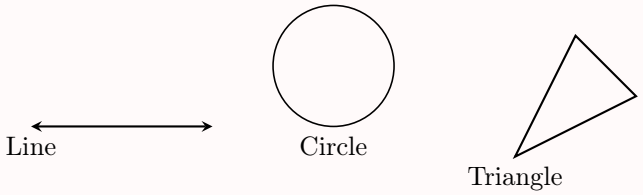
2D SHAPES

A PLANE GEOMETRY

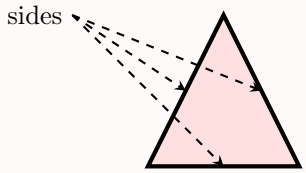
Definition Plane Geometry

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.



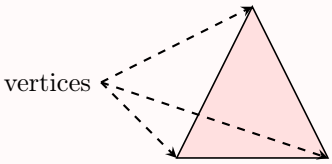
Definition Side

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.

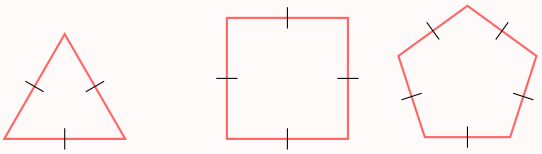
Definition Classification of Polygons

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**

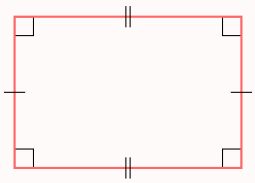
A **regular polygon** has all sides the same length and all angles the same size.



Equilateral Triangle Square Regular Pentagon

Definition **Rectangle**

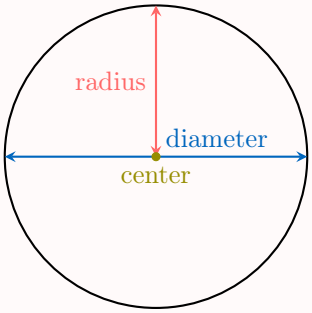
A **rectangle** is a quadrilateral (a 4-sided polygon) with four right angles. In a rectangle, opposite sides are equal in length.



C CIRCLES

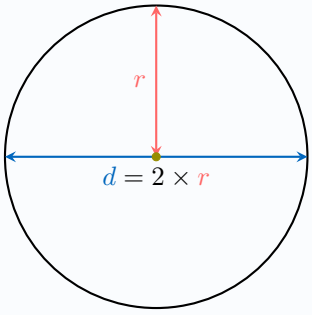
Definition **Circle**

A **circle** is a flat shape. Every point on the circle is the same distance from a point called the **center**.
The **radius** is a line segment from the center to a point on the circle. The radius is also the length of this segment.
The **diameter** is a line segment that goes across the circle through the center and connects two points on the circle. The diameter is also the length of this segment.

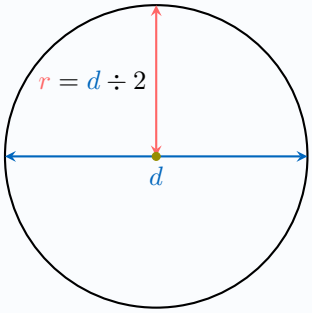


Proposition **Diameter-Radius Rule**

- The diameter is twice as long as the radius: $d = 2 \times r$.



- The radius is half of the diameter: $r = d \div 2$.


$r = d \div 2$
d