Perimeter and Area

Triangle:

A **triangle** is a polygon with **three vertices**, and **three sides** or edges that are line segments. A triangle with vertices *A*, *B*, and *C* is denoted as ${}^{\Delta}ABC$

The **area of a triangle** is the space enclosed by its three sides. It is given by the formula, $A = \frac{1}{2}bh_{i}$ where b is the base and h is the altitude.



Quadrilateral

A **simple closed figure** bounded by four line segments is called a **quadrilateral**.

Various types of quadrilateral are:

- Rectangle
- Square
- Parallelogram
- Rhombus



Rectangle

A **rectangle** is a **quadrilateral** with opposite sides equal, and each angle of measure 90°.

The **perimeter of a rectangle** is twice the sum of the lengths of its adjacent sides.

In the figure, the perimeter of rectangle ABCD = 2(AB + BC).

The **area of a rectangle** is the product of its length and breadth.

In the figure, the area of rectangle ABCD = $AB \times BC$.



Square

A **square** is a **quadrilateral** with four equal sides, and each angle of measure 90°.

The **perimeter of a square** with side *s* units is 4*s*.

In the figure, the perimeter of square ABCD = 4AB or 4BC or 4CD or 4DA.

The **area of a square** with side *s* is s^2

In the figure, the perimeter of square ABCD = AB^2 or BC^2 or CD^2 or DA^2 .



Parallelogram

A **quadrilateral** in which both the pairs of opposite sides are parallel is called a **parallelogram**.

The **perimeter of a parallelogram** is twice the sum of the lengths of the adjacent sides.

In the figure, the perimeter of parallelogram ABCD = 2(AB + BC)

The area of a parallelogram is the product of its base and perpendicular height or altitude.

Any side of a parallelogram can be taken as the base. The perpendicular dropped on that side from the opposite vertex is known as the **height (altitude)**.

In the figure, the area of parallelogram $ABCD = AB \times DE \text{ or } AD \times BF$.



A parallelogram in which the adjacent sides are equal is called a rhombus.

The perimeter and area of a rhombus can be calculated using the same formula as that for a parallelogram.



Circle:

A circle is defined as a collection of points on a plane that are at an equal distance from a fixed point on the plane. The fixed point is called the **centre** of the circle.

Circumference:

The distance around a circular region is known as its circumference.

Diameter:

Any straight line segment that passes through the centre of a circle and whose end points are on the circle is called its diameter.

Radius:

Any line segment from the centre of the circle to its circumference.



Circumference of a circle = $2\pi r$, where r is the radius of the circle or Circumference of a circle = πd , where d is the diameter of the circle.

Circumference = Diameter x 3.14

Diameter(d) is equal to twice radius(r). d = 2r

Circles with the **same centre** but different radius are called **concentric circles**.

Circle:

The **area** of a circle is the region enclosed in the circle.

The **area of a circle** can be calculated by using the formula:

- $\frac{\pi r^2}{\pi D^2}$, if **radius** r is given $\frac{\pi D^2}{4\pi}$, if **diameter** D is given $\frac{c^2}{4\pi}$ if **circumference** C is given

