Chapter- 20

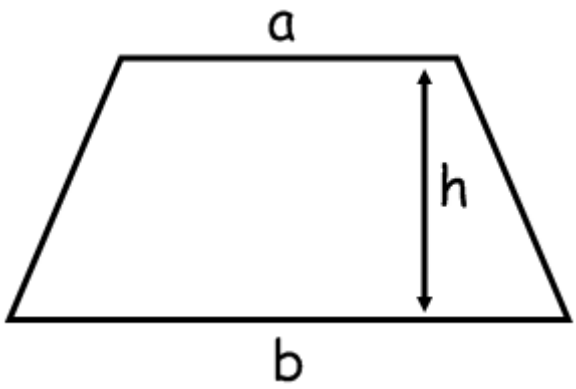
Area of a Trapezium and a Polygon

Area and Perimeter of Some 2D Shapes

Shape	Image	Area	Perimeter
Square		$(Side)^2$	4 × Side
Rectangle		Length × Breadth	2(Length + Breadth)
Triangle		(1/2) × Base × Height where, a, b and c are the three sides of the triangle)	a + b + c
Parallelogram		Base × Height	2(sum of adjacent sides)
Circle		πr^2	$2\pi r$ Where, r = radius of the circle

Area of Trapezium

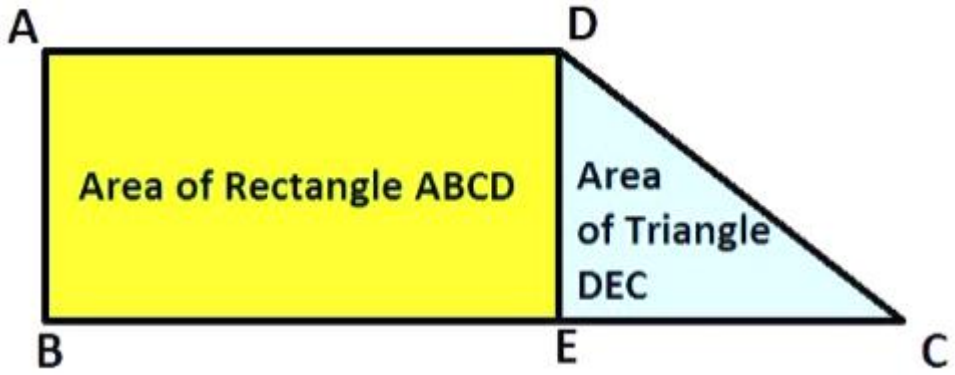
A trapezium is a quadrilateral whose two sides are parallel. And if its non-parallel sides are equal then it is said to be an isosceles trapezium.



Area of Trapezium can be found,

1. By splitting the figure

One way to find the Area of trapezium is to divide it into two or three plane figures and then find the area.



In the trapezium ABCD,

It can be divided into two parts i.e. a rectangle and a triangle.

Area of ABCD = Area of ABED + Area of DEC

2. By using formula

Another way is to calculate the area by using formula.

$$\text{Area of Trapezium} = \frac{1}{2}(a + b) \times h$$

Area of trapezium is half of the product of the summation of the parallel sides and the perpendicular distance between them.

Circles

It is a round, closed shape.

The circumference of a Circle

The circumference of a circle refers to the distance around the circle.

- **Radius:** A straight line from the Circumference till the centre of the circle.

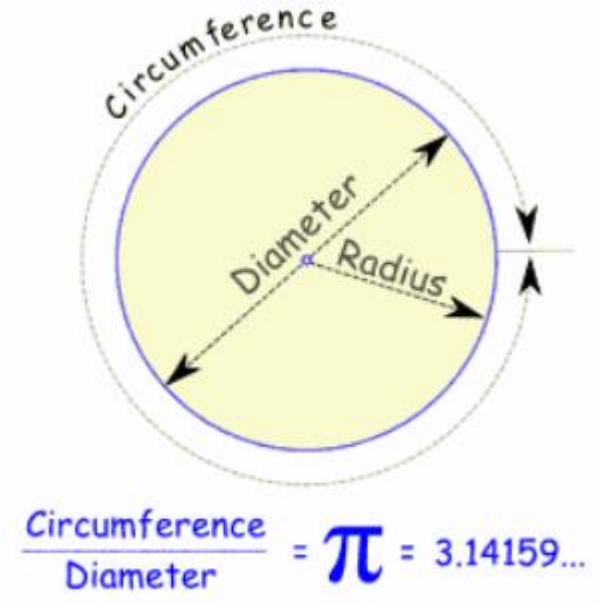
- **Diameter:** It refers to the line from one point of the Circumference to the other point of the Circumference.
- **π (pi):** It refers to the ratio of a circle's circumference to its diameter.

$$\frac{\text{Circumference}}{\text{Diameter}} = \pi$$

Circumference(c) = π × diameter

C = πd

= π × 2r



Note: diameter (d) = twice the radius (r)

d = 2r

Example

What is the circumference of a circle of diameter 12 cm (Take π = 3.14)?

Solution

C = πd

C = 3.14 × 12

= 37.68 cm

Area of Circle

Area of the circle = (Half of the circumference) × radius

= πr^2