Understanding Elementary Shapes

• One complete turn of the hand of a clock is one revolution. The angle of one revolution is called a **complete angle**.



• A right angle is $\left(\frac{1}{4}\right)^{\text{th}}$ of a revolution and a straight angle is $\left(\frac{1}{2}\right)^{\text{th}}$ of a revolution.



- 1 complete angle = 2 straight angles = 4 right angles
- 1 straight angle = 2 right angles
- If an angle measures less than a right angle then it is known as an acute angle.

The following angles are acute:



• If an angle measures more than a right angle but less than a straight angle, then it is an **obtuse angle**.

The following angles are obtuse:



• If an angle measures more than a straight angle, then it is known as a **reflex angle**.



The following angles are reflex:

- We use a protractor to measure an angle.
- One complete revolution is divided into 360 equal parts. Each part is called a degree. Thus, the unit of angle is degree (°).
- Right angle measures 90°, complete angle measures 360°, and straight angle measures 180°.
- Acute angle is less than 90°, obtuse angle is more than 90° but less than 180°, and reflex angle is more than 180° but less then 360°.
- We can measure the given angle using a protractor as follows:



We overlap the protractor with the given angle by coinciding the midpoint of the protractor with the vertex of the angle in such a way that the straight edges of the protractor coincide with the arm of the given angle.



It is seen that the measure of the given angle is 140° .

• Two lines are perpendicular, if the angle between them is 90° .



Here, lines l and m are perpendicular.

• A line segment AB is called the perpendicular bisector of line segment CD, if \overline{AB} is perpendicular to \overline{CD} and \overline{AB} divides \overline{CD} into two equal parts.



Here, line segment AB is the perpendicular bisector of line segment CD.

- A triangle can be classified on the basis of the measures of its angles and sides.
- Classification of triangles on the basis of the measures of its angles:

Name	Nature of the angle
Acute-angled triangle	Each angle is acute
obtuse-angled triangle	One angle is obtuse
Right-angled triangle	One angle is a right angle

• Classification of triangles on the basis of the lengths of its sides:

Name	Nature of the angle
Scalene triangle	All three sides are of unequal length
Isosceles triangle	Any two sides are of equal length
Equilateral triangle	All sides are of equal length

• Quadrilaterals are classified according to their properties.

Name of the quadrilateral	Figure	Properties
Rectangle		Opposite sides are equal.
	S.,	Each angle is 90°.
	а	Diagonals are equal.
		Opposite sides are parallel.

		All sides are equal.
Square	ц Т Т	Each angle is 90°.
		Diagonals are equal.
		Opposite sides are parallel.
	logram	Opposite sides are parallel.
Parallelogram		Opposite sides are equal.
		Diagonals are not equal.
Rhombus	Opposite sides are parallel.	
	[]	All sides are equal.
		Diagonals may or may not be equal.
Trapezium		One pair of opposite sides is parallel.

- A parallelogram is a rhombus if all sides are equal.
- A parallelogram is a rectangle if all angles are 90°.
- A parallelogram is a square if all sides are equal and all angles are 90°.
- A rhombus is a square if all angles are 90°.
- A Rectangle is a square if all sides are equal.
- A polygon's name is based on the number of its sides.

Number of sides	Figure	Name
3	\bigtriangleup	Triangle

4	\bigcirc	Quadrilateral
5	\square	Pentagon
6	\bigcirc	Hexagon
8	\bigcirc	Octagon

• We see a few shapes in our day- to-day life which are not flat. Some of these shapes are solids.



• Each side of a cuboid is flat, called a **flat surface** (or surface). Two faces meet at a line segment called an **edge**. Three edges meet at a point called the **vertex**.



Solid	Figure	Properties
Cube		6 faces 12 edges 8 vertices (corners)
Cuboid		6 faces 12 edges 8 vertices
Cylinder		2 flat faces (circles) 1 curved face
Cone		1 flat surface 1 curved surface 1 vertex
Triangular Pyramid		4 faces 6 edges 4 vertices
Square pyramid		5 faces 8 edges 5 vertices

