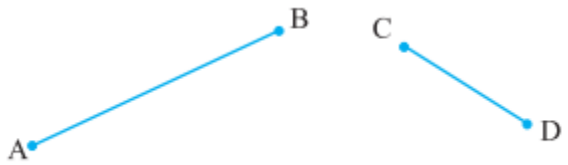
CBSE Class 6 NCERT Maths Chapter 5 Understanding Elementary Shapes Notes

Below we have given topic-wise notes for the CBSE Class 6 NCERT Maths Chapter 5 Understanding Elementary Shapes. Take a printout to study later when you need quick revision before going to the exam hall.

Topic 1: Measuring Line Segments

- **Measuring Line Segments:** A line segment is a fixed portion of a line. This makes it possible to measure a line segment. This measure of each line segment is a unique number called its “length”. Any two given line segments can be compared in the following ways:
    1. **By Observation:** Some comparisons need no tool, such as the comparison by observation.

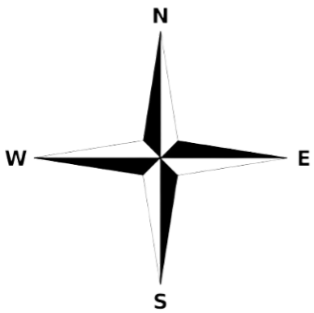


Among the line segments AB and CD, CD is smaller in length.

2. **By Tracing:** In this comparison, we use tracing paper to draw one of the two given line segments and draw it next to the other one and then compare by observation.
3. **By Ruler:** For accurate differences in the lengths of given line segments, we use rulers.

Topic 2: Right Angle and Straight Angle

- **Right Angle:** Consider the direction line,



Suppose you are standing facing the East direction. If you turn to face the North or the South direction then, you will be said to have taken a right-angle’s turn.
Similarly, from facing North to facing South, you have turned by two right angles.

- **Straight Angle:** The turn from north to south is by two right angles; it is called a straight angle.
- **Complete Angle:** Suppose the second hand of a clock starts moving from 12 and it completes a round to return on 12. Then, the second hand is said to have made a complete angle. Or we can say that two straight angles combinedly form a complete angle.

Topic 3: Acute, Obtuse and Reflex Angles

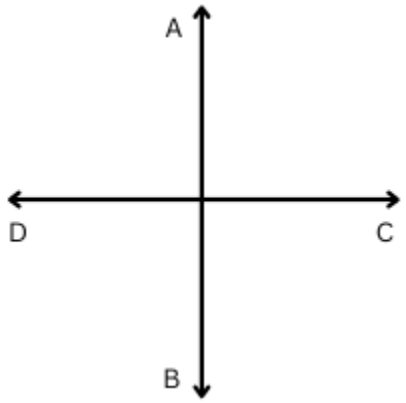
- **Acute Angle:** An angle smaller than a right angle is called an acute angle.
- **Obtuse Angle:** If an angle is larger than a right angle but less than a straight angle, it is called an obtuse angle
- **Reflex Angle:** A reflex angle is larger than a straight angle.

Topic 4: Measuring of Angles

- **Measuring of Angles by Degrees (°):** We measure angles in degrees (°). One complete revolution of a clock's hand is divided into 360 equal parts. Each part is a degree. We write 360° to say 'three hundred sixty degrees'. A complete angle comprises 360°.

Topic 5: Perpendicular Lines

- **Perpendicular Lines:** When two lines intersect and the angle between them is a right angle, then the lines are said to be perpendicular.
  For eg, the lines AB and CD are perpendicular.

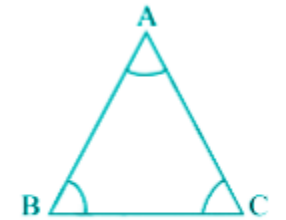


Topic 6: Classification of Triangles

- **Naming Based on the Length of Sides of the Triangle:**
  1. **Scalene Triangle:** A triangle having all three unequal sides is called a Scalene Triangle.
  2. **Isosceles triangle:** A triangle having two equal sides is called an Isosceles Triangle.

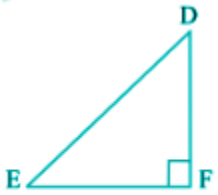
3. **Equilateral Triangle:** A triangle having three equal sides is called an Equilateral Triangle.

- **Naming Based on the Angles Between Each Side of the Triangle:**
  1. **Acute-angled Triangle:** If each angle is less than 90°, then the triangle is called an acute-angled triangle.



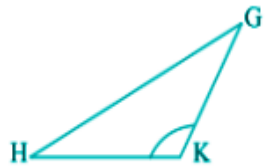
Acute-angled Triangle

  2. **Right-angled Triangle:** If any one angle is a right angle then the triangle is called a right-angled triangle.



Right-angled Triangle

  3. **Obtuse-angled Triangle:** If any one angle is greater than 90°, then the triangle is called an obtuse-angled triangle.



Obtuse-angled Triangle

Topic 7: Quadrilaterals

A quadrilateral is a polygon which has four sides. Now let us see different types of Quadrilaterals.

- **Rectangle:** A rectangle is a quadrilateral that has opposite sides of equal lengths. All the sides make a 90° angle between them.

- **Square:** A square is a quadrilateral that has all sides of the same length. All the sides make a 90° angle between them.

- **Parallelogram:** The lengths of the opposite sides in a parallelogram are the same but the angle between them is not equal to 90°.

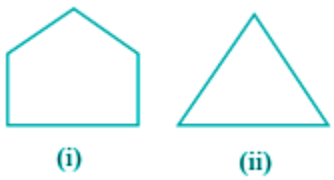
- **Rhombus:** Just like a square, the length of all sides in a rhombus is the same except the angle formed by these two sides is not equal to 90°.

- **Trapezium:** It is a quadrilateral whose one pair of sides are parallel to each other.

Topic 8: Polygons

We have studied only two types of polygons till yet. One with 3 sides, i.e. triangles and another with 4 sides, i.e. quadrilateral. Let's study more types of polygons.

- **Polygons:** Any closed shape formed solely by line segments is called Polygons.
  For eg,



- **Triangle:** The polygon with 3 sides.
- **Quadrilateral:** A polygon with 4 sides is called a quadrilateral.
- **Pentagon:** A polygon with 5 sides is called a Pentagon.
- **Hexagon:** A polygon with 6 sides is called a Hexagon.

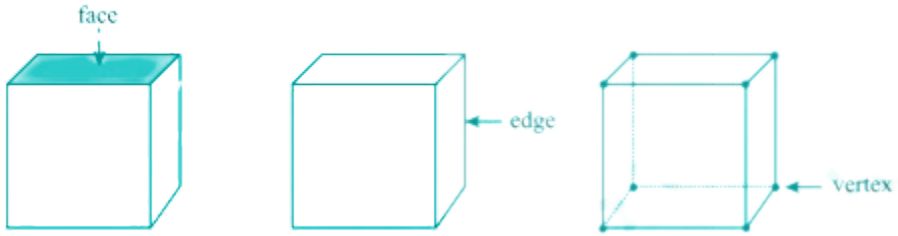
- **Octagon:** A polygon with 8 sides is called an Octagon.

Topic 9: Three-Dimensional Figures

- **Three-Dimensional (3D) Figures:** Any shape that is not flat is called a 3D figure.

Now, let us consider a cube to understand the following concepts.

- **Faces:** Each side of the cube is a flat surface called a flat face (or simply a face).
- **Edges:** Two faces meet at a line segment called an edge
- **Vertex:** Three edges meet at a point called a vertex.



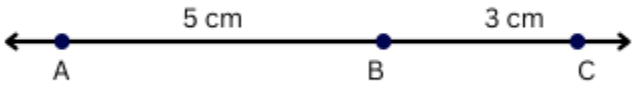
CBSE Class 6 NCERT Maths Chapter 5 Understanding Elementary Shapes Important Exercise Questions and Answers: Free PDF Download

Below we have provided some important exercise questions and their solutions from Chapter 4 of CBSE NCERT Maths for Class 6.

Exercise 5.1

Q 1. What is the disadvantage of comparing line segments by mere observation?
Ans. Comparison by observation is helpful when the difference between the lengths of given line segments is visibly large. However, for measuring slight differences, this method is not useful.

Q 2. If A, B, and C are three points on a line such that AB = 5 cm, BC = 3 cm and AC = 8 cm, which one of them lies between the other two?
Ans. Let us observe the given case below.



Clearly, point B lies between points A and C.

Exercise 5.2

Q 1. What fraction of a clockwise revolution does the hour hand of a clock turn though, when it goes from

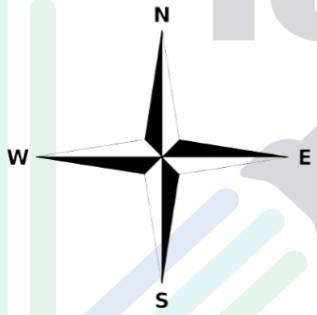
(a) 3 to 9
(b) 4 to 7
(c) 7 to 10
(d) 1 to 10

Ans. One complete revolution of an hour's hand of a clock is equal to 360°.

(a) On moving from 3 to 9, the hour's hand completes half a revolution. Therefore, the hour hand moves 180°/360° = 1/2 fraction of the clock.
(b) On moving from 4 to 7, the hour's hand completes a right angle. Therefore, the hour hand moves 90°/360° = 1/4 fraction of the clock.
(c) On moving from 7 to 10, the hour's hand completes half a revolution. Therefore, the hour hand moves 180°/360° = 1/2 fraction of the clock.
(d) On moving from 1 to 10, the hour's hand completes 3 right angles. Therefore, the hour hand moves 270°/360° = 3/4 fraction of the clock.

Q 2. How many right angles do you make if you start facing
(a) South and turn clockwise to the west?
(b) North and turn anti-clockwise to the east?

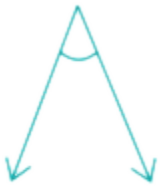
Ans. Let us see the direction map before solving this question.



(a) On taking a clockwise turn from South to West, 1 right angle is covered.
(b) On taking an anti-clockwise turn from North to east, 3 right angles are covered.

Exercise 5.3

Q 1. Classify each one of the following angles as right, straight, acute, obtuse or reflex:



(a)

(b)

(c)

(d)

Ans. The angles to be considered are marked with a small curve in each figure:

(a) The given angle is smaller than a right angle, it is an acute angle.
(b) Obtuse angle
(c) The given angle is greater than 180°, it is a Reflex angle.
(d) Right angle

Exercise 5.4

Q 1. Say True or False :

(a) The measure of an acute angle < 90°.
(b) The measure of an obtuse angle < 90°.
(c) The measure of a reflex angle > 180°.
(d) The measure of one complete revolution = 360°.
(e) If mA∠ = 53° and mB∠ = 35°, then mA∠ > mB∠.

Ans: The answers are:

(a) True, an acute angle is smaller than a right angle.
(b) False, an obtuse angle is greater than the right angle, i.e. > 90°.
(c) True, a reflex angle is greater than 180°.
(d) True
(e) True, ∠A > ∠B.

Q 2. Fill in the blanks with acute, obtuse, right or straight :

(a) An angle whose measure is less than that of a right angle is_____.
(b) An angle whose measure is greater than that of a right angle is _____.

(c) An angle whose measure is the sum of the measures of two right angles is _____.

(d) When the sum of the measures of two angles is that of a right angle, then each one of them is _____.

(e) When the sum of the measures of two angles is that of a straight angle and if one of them is acute then the other should be _____.

Ans: The answers are:

(a) Acute angle

(b) Obtuse angle

(c) Straight angle

(d) Acute angle

(e) Obtuse angle

Exercise 5.5

Q 1. Which of the following are models for perpendicular lines :

(a) The adjacent edges of a tabletop.

(b) The lines of a railway track.

(c) The line segments forming the letter 'L'.

(d) The letter V.

Ans. The answers are:

(a) The adjacent sides of a tabletop are placed at 90°, hence, they are perpendicular.

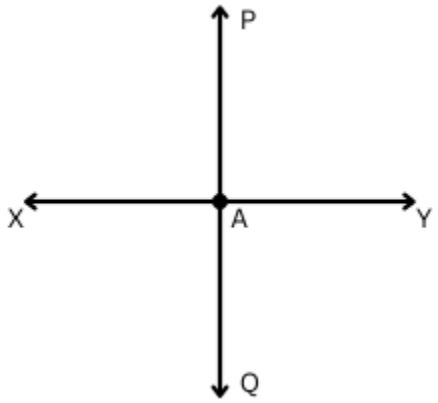
(b) The lines of a railway track do not intersect each other. Hence, they are parallel and not perpendicular.

(c) These are perpendicular.

(d) No, the line segments in the letter V are not perpendicular to each other.

Q 2. Let PQ be the perpendicular to the line segment XY. Let PQ and XY intersect in the point A. What is the measure of ∠PAY?

Ans. Let us observe the following figure.



Because the line PQ is perpendicular to the line XY, ∠PAY = 90°.

Exercise 5.6

Q 1. Name the types of following triangles :

(a) Triangle with lengths of sides 7 cm, 8 cm and 9 cm.
(b) ∆ABC with AB = 8.7 cm, AC = 7 cm and BC = 6 cm.
(c) ∆PQR such that PQ = QR = PR = 5 cm.
(d) ∆DEF with m D∠ = 90°
(e) ∆XYZ with m Y∠ = 90° and XY = YZ.
(f) ∆LMN with m L ∠ = 30°, m M∠ = 70° and m N∠ = 80°

Ans: The answers are:

(a) Since all sides are of unequal lengths, the given triangle is a scalene triangle.
(b) Again, since all sides are of unequal lengths, the given triangle is a scalene triangle.
(c) All sides are equal, so it is an equilateral triangle.
(d) Right-angled triangle
(e) One angle is 90° and two sides are of the same lengths, it is a right-angled isosceles triangle.
(f) All angles are less than 90°, it is an acute triangle.

Exercise 5.7

Q 1. Say True or False :

(a) Each angle of a rectangle is a right angle.
(b) The opposite sides of a rectangle are equal in length.
(c) The diagonals of a square are perpendicular to one another.
(d) All the sides of a rhombus are of equal length.
(e) All the sides of a parallelogram are of equal length.
(f) The opposite sides of a trapezium are parallel.

Ans. The answers are given below.

(a) True
(b) True
(c) True
(d) True
(e) False, all the sides of a parallelogram are not of equal length.
(f) False, all sides of a trapezium are not parallel.

Q 2. A figure is said to be regular if its sides are equal in length and angles are equal in measure. Can you identify the regular quadrilateral?

Ans. The quadrilateral mentioned here is a square as it has equal sides and all its angles are equal inside.

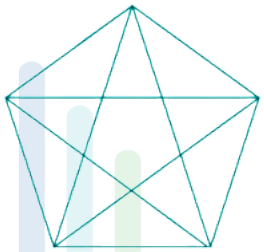
Exercise 5.8

Q 1. Draw a rough sketch of a regular hexagon. Connecting any three of its vertices, draw a triangle. Identify the type of the triangle you have drawn.

Ans. Let us draw the figure below.

So, by connecting the alternate vertices of a regular hexagon, we can draw an equilateral triangle.

Q 2. A diagonal is a line segment that joins any two vertices of the polygon and is not a side of the polygon. Draw a rough sketch of a pentagon and draw its diagonals.
Ans. The diagonals of a pentagon are shown below.



Exercise 5.9

Q 1. Match the following:

(a) Cone	**(i)** 
(b) Sphere	**(ii)** 
(c) Cylinder	**(iii)** 
(d) Cuboid	**(iv)** 
(e) Pyramid	**(v)** 

Give two new examples of each shape.

Ans. The correct matches are given below.

(a) Cone	**(ii)** 
(b) Sphere	**(iv)** 
(c) Cylinder	**(v)** 
(d) Cuboid	**(iii)** 
(e) Pyramid	**(i)** 

The two new examples of each shape are given below.

(a) Examples of a cone are an ice cream cone and a birthday cap.
(b) Examples of a sphere are a cricket ball and a pool ball.
(c) Examples of a cylinder are the road roller and a rolled calendar.
(d) Examples of a cuboid are a matchbox and a brick.
(e) Examples of a pyramid are a prism and a cut diamond.