Name : _____

Grade : **VI**

Subject : **Mathematics**

Chapter: 5 Understanding elementary shapes

Objective Type Questions

I. Multiple choice questions

1. Measures of the two angles between hour and minute hands of a clock at 9 O' clock are:

   a. 60°, 300° b. 270°, 90° c. 75°, 285° d. 30°, 330°

2. If a bicycle wheel has 48 spokes, then the angle between a pair of two consecutive spokes is:

   a. $\left(5\frac{1}{2}\right)$ b. $\left(7\frac{1}{2}\right)$ c. $\left(\frac{2}{11}\right)$ d. $\left(\frac{2}{5}\right)$

3. If the sum of two angles is greater than 180°, then which of the following is not possible for the two angles?

   a. One obtuse angle and one acute angle

   b. One reflex angle and one acute angle

   c. Two obtuse angles

   d. Two right angles

4. If the sum of two angles is equal to an obtuse angle, then which of the following is not possible?

   a. One obtuse angle and one acute angle

   b. One right angle and one acute angle

   c. Two acute angles

   d. Two right angles

5. In Fig., $AB = BC$ and $AD = BD = DC$. The number of isosceles triangles in the figure is:

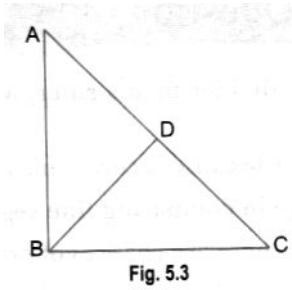
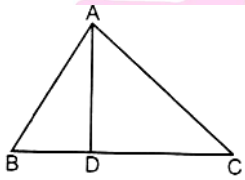


Fig. 5.3

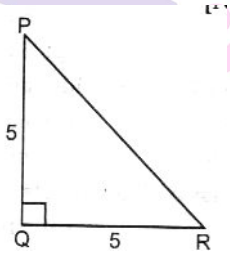
a. 1 b. 2 c. 3 d. 4

6. In Fig., < BAC = 90° and $AD \perp BC$. The number of right angled triangles in the figure is:



a. 1 b. 2 c. 3 d. 4

7. In Fig., $PQ \perp RQ, PQ$ = 5 cm and QR= 5 cm. Then ΔPQR is:



a. A right triangle but not isosceles

b. An isosceles right triangle

c. Isosceles but not a right triangle

d. Neither isosceles nor right triangle

8. The number of obtuse angles in Fig., is:

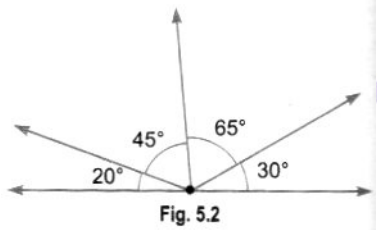


Fig. 5.2

a. 2 b. 3 c. 4 d. 5

9. What is the angle measure for half a revolution?

a. 60^0 b. 90^0 c. 180^0 d. 270^0

10. What fraction of a clockwise revolution does the hour hand of a clock turn through when it goes from 3 to 9?

a. $\frac{1}{2}$ b. $\frac{1}{3}$ c. $\frac{1}{4}$ d. 1/5

11. Where will the hand of a clock stop if it starts at 5 & makes 1/4 of a revolution, clockwise?

a. 7 b. 8 c. 9 d. 10

12. Which direction will you face if you start facing south & make one full revolution?

a. East b. West c. North d. South

13. Where will the hour hand of a clock stop if it starts from 6 & turns through one right angle?

a. 7 b. 8 c. 9 d. 10

14. What is the measure of a straight angle?

a. 75° b. 90° c. 180° d. 360°

15. What is the measure of each angle of an equilateral triangle?

a. 55° b. 70° c. 60° d. 90°

16. A quadrilateral whose all the sides, angle and diagonals are equal called is a

a. Square b. rhombus c. rectangle d. 5 faces

17. A triangular prism has

a. 9 faces b. 8 faces c. 7 faces d. 5 faces

18. A triangle whole two sides are equal is called

a. Scalene b. equilateral c. isosceles d. none of these

19. A square has both diagonals

a. Equal b. unequal c. both (a) and (b) d. none of these

20. For a prism the value of $V + F - E$ is always

a. 0 b. 1 c. 2 d. 3

21. A triangle whose one angle is more than 90° is called

a. An obtuse triangle b. an acute triangle

c. an equilateral triangle d. none of these

1. (b)	2. (b)	3. (d)	4. (d)	5. (c)	6. (c)	7. (b)
8. (c)	9. (c)	10. (a)	11. (b)	12. (d)	13. (b)	14. (c)
15. (c)	16. (a)	17. (d)	18. (c)	19. (a)	20. (c)	21. (a)

II. Multiple choice questions

1. In Fig. 5.1 if point A is shifted to point B along the ray PX such that PB = 2PA, then the measure of ∠BPY is [NCERT Exemplar]

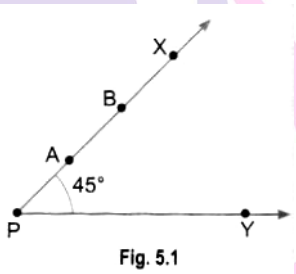


Fig. 5.1

a. Greater than 45^0 b. 45^0 c. Less than 45^0 d. 90^0

2. The number of right angles made when we start from north and turn anticlockwise to west is

a. 1 b. 2 c. 3 d. 4

3. A polygon has prime number of sides. Its number of sides is equal to the sum of the two least consecutive primes. The number of diagonals of the polygon is

a. 4 b. 5 c. 7 d. 10

4. Which of the following statements is not true for a rhombus?

a. The diagonals are perpendicular to each other

b. The diagonals are equal. c. The diagonals bisect each other.

d. The diagonals are perpendicular bisectors of each other.

1. b	2. a	3. b	4. b

IV. Multiple choice questions

1. The angle measure for one-fourth revolution is:

a. 90^0 b. 360^0 c. 180^0 d. None of these.

2. Through what angle measures does the hour of a clock through, when it goes from3 to 9?

a.90^o b. 180^0 c. 360^o d. none of these

3. Through what angle measures does the hour hand of a clock turn through, when it goes from 5 to 8?

a.90^o b. 180^0 c. 360^o d. none of these

4. Through what angle measures does the hour hand of a clock turn through, when it goes from 12 to 9

a. 270^0 b. 180^0 c. 360^0 d. 90^0

5. Through what angle does the hour hand of a clock turn through, when it goes from 2 to 11?

a.270^0 b. 90^0 c. 360^0 d. 180^0

6. Through what angle does the hour hand of a clock turn through, when it goes from 6 to 3?

a.90^0 b. 180^0 c. 270^0 d. 360^0

7. What part of a revolution have you turned through if you stand facing north and turn clockwise to face west?

a. ¼ b. ½ c. ¾ d. None of these

8. What part of a revolution have you turned through if you stand facing east and turn clockwise to face west?

a. $\frac{1}{4}$ b. $\frac{1}{2}$ c. $\frac{3}{4}$ d. None of these

9. What part of a revolution have you turned through if you stand facing north and turn clockwise to face east?

a. $\frac{1}{4}$ b. $\frac{1}{2}$ c. $\frac{3}{4}$ d. None of these

10. Find the number of right angles turned through by the are hand of a clock when it goes from 12 to 3?

a. 1 b. 2 c. 3 d. 4

11. Find the number of right angles turned through by the are hand of a clock when it goes from 4 to 10?

a. 1 b. 2 c. 3 d. 4

12. Find the number of right angles turned through by the are hand of a clock when it goes from 3 to 12?

a. 1 b. 2 c. 3 d. 4

13. How many right angles do you make if you start facing north and turn clockwise to south?

a. 1 b. 2 c. 3 d. 4

14 How many right angles do you make if you start facing east and turn clockwise to south?

a. 1 b. 2 c. 3 d. 4

15. How many right angles do you make if you start facing south and turn clockwise to east?

a. 1 b. 2 c. 3 d. 4

16. How many right angles do you make if you start facing east and turn clockwise to east?

a. 1 b. 2 c. 3 d. 4

17. The measure of right angle is

a. 45^0 b. 90^0 c. 60^0 d. 180^0

18. The measure of straight angle is

a. 90^0 b. 45^0 c. 180^0 d.60^0

19.T he measure of an acute angle is

a . $< 90^0$ b. $> 90^0$ c= 90° d. none of these

20. The measure of an obtuse angle is

a. $< 90^0$ b. > 90° and < 180° c. = 90° d. none of these

21. The measure of an reflex angle is

a.180 b. < 180° c. > 180° d. < 90°

22. Which of the following is the measure of an acute angle?

a. 30^0 b. 90 c.120^0 d. 210^0

23. Which of the following is the measure of an obtuse angle?

a.120^0 b.90^0 c.60^0 d. 240^0

24. Which of the following is the measure of an reflex angle?

a.90^0 b.180^0 c.120^0 d.270^0

25. A triangle having three unequal sides is called a

a. scalene triangle b. isosceles triangle

c. equilateral triangle d. right triangle

25. A triangle having two equal sides is called a

a. scalene triangle b. isosceles triangle

c. equilateral triangle d. right angled triangle

26. A triangle having three equal sides is called a

a. scalene triangle b. isosceles triangle

c. equilateral triangle d. right triangle

27. Which of the following statement is true

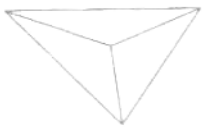
a. The opposite sides of trapezium are parallel

b. All the sides of parallelogram are of equal in length

c. The diagonals of square are perpendicular to each other

d. All the angles of a rectangle are not equal.

28. The following shape



is of a

a. Cone b. cylinder c. sphere d. pyramid.

29. The shape

is of

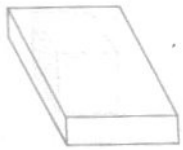
a. cylinder b. cone c. Sphere d. cuboid

30. The shape

is of

a. cone b. cylinder c. Cuboid d. sphere

31. The shape



Is of

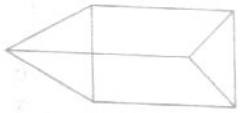
a. cuboid b. Cylinder c. Cone d. sphere

32. The shape

Is of

a. Cone b. cylinder c. Sphere d. pyramid

33. The shape



Is of

a. Triangular prism b. pyramid

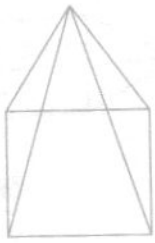
c. cuboid d. cylinder

34. The number of faces of the shape

Is

a. 2 b. 4 c. 5 d. 3

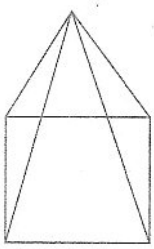
35. The number of edges of the shape



Is

a. 4 b. 8 c. 10 d. 12

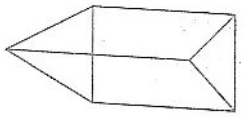
36. The number of corners of the shape



Is

a. 8 b. 6 c. 5 d. 3

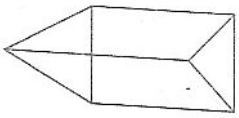
37. The number of faces of the shape



Is

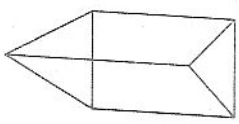
a. 2 b. 3 c. 9 d. 5

38. The number of edges of the shape



a. 6 b. 8 c. 9 d. 4

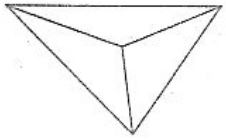
39. The number of corners of the shape.



Is

a. 1 b. 2 c. 4 d. 6

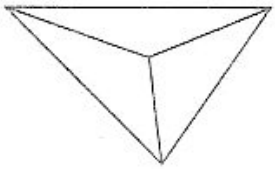
40 The number of faces of the shape



Is

a. 1 b. 2 c. 3 d. 4

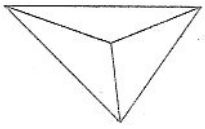
41. The number of edges of the shape



Is

a.3 b. 6 c. 4 d. 15

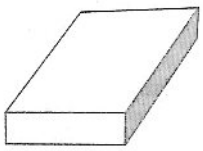
42. The number of vertices of the shape



is

a. 1 b. 2 c. 3 d. 4

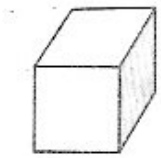
43. The number of faces of the shape



is

a. 2 b. 4 c. 3 d. 6

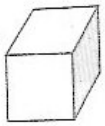
44. The number of edges of the shape



is

a. 12 b. 6 c. 9 d. 8

45. The number of vertices of the shape



is

a. 4 b. 6 c. 5 d. 8

46. The number of vertices of a shape is

a. 0 b. 1 c. 2 d. none of these

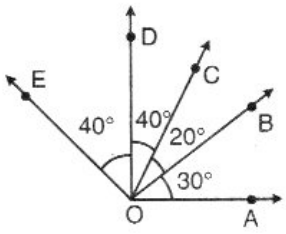
47. The number of corners of a cylinder is

a. 0 b. 1 c. 2 d. none of these

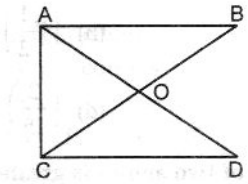
1. (c)	2. (a)	3. (a)	4. (a)	5. (c)	6. (c)	7. (b)	8. (a)	9. (a)	10. (b)
11. (c)	12. (b)	13. (a)	14.(c)	15. (d)	16. (b)	17. (c)	18. (a)	19. (b)	20. (c)
21. (a)	22. (a)	23. (d)	24. (a)	25. (b)	26. (c)	27. (c)	28. (d)	29. (b)	30. (b)
31. (a)	32. (c)	33. (a)	34. (c)	35. (b)	36. (c)	37. (d)	38. (c)	39. (d)	40. (d)
41. (b)	42. (d)	43. (d)	44. (a)	45. (d)	46. (a)	47. (a)			

I. Fill in the blanks.

1. In Fig.,:
   a. $\angle AOD$ is a/an _____ angle.
   b. $\angle COA$ is a/an _____ angle.



   c. $\angle AOE$ is an a/an _____ angle.
2. The number of triangles in Fig., is _____. Their name are _____.
3. Number of angles less than 180° in Fig., is _____and their names are _____.



4. The number of straight angles in above Fig., is _____.
5. The number of right angles in a straight angle is _____ and that in a
6. Measure of an acute angle is less than _____.
7. Measure of an obtuse angle is greater than _____ but less than _____.
8. Complement of an angle of 45° is _____.
9. Angles are measured in _____.
10. A _____ is a rectangle with a pair of adjacent sides equal.
11. Triangle is classified in terms of _____ as well as _____.
12. A complete angle = _____.
13. Sum of all angles of a pentagon is _____.

1. a) Right b) Acute c) Obtuse	2. 5, $\Delta AOB, \Delta AOC, \Delta ACD, \Delta COD, \Delta ABC$
3. 12, $\angle OAB, \angle OBA, \angle OAC, \angle OCA, \angle OCD, \angle ODC,$ $\angle AOB, \angle AOC, \angle COD, \angle DOB, \angle BAC, \angle ACD$	4. Five

5. Two, four	6. 90°
7. 90°, 180°	8. 45°
9. Degrees	10. Square
11. Sides, angles	12. 360°
13 .540°	

III. Fill in the blanks.

1. The number of diagonals in a hexagon is _____.
2. A pair of opposite sides of a rectangle are _____ and _____
3. The hour hand of a clo9ck stops at _____, if it starts at 12 and makes $\frac{1}{2}$ revolution clockwise.
4. The angle formed in half-revolution is _____
5. The number of degrees between the hands of a clock, when the time is 3 O' clock _____
6. Number of faces in a triangular pyramid are _____.
7. The number of vertices of a cuboid are _____.
8. In a scalene triangle, all sides are _____.
9. Reflex angle is always_____ 180^0 and _____ 360^0

1. nine	2. equal, parallel	3. 6	4. 180^0	5. 90^0
7. 3	8. 8	9. unequal	10. greater than, less than	

I. True / False

1. A horizontal line and a vertical line always intersect at right angles.
2. If the arms of an angle on the paper are increased, the angle increases.
3. If the arms of an angle on the paper and decreased, the angle decreases.
4. In rectangle diagonals bisect at 90°.
5. An equilateral triangle is acute angled triangle.
6. The line segments forming letter T from perpendicular lines.
7. An obtuse angled triangle can be isosceles.
8. The point at which two adjacent sides of a polygon meet is called its vertex.

1. True	2. False	3. False	4. False	5. True	6. True	7. True	8. True

III. True / False

1. Perpendicular bisector is perpendicular to the line.
2. Diagonals of a rhombus are always equal. **[NCERT Exemplar]**
3. The base of a pyramid is always a triangle.
4. A trapezium is a parallelogram.
5. The number of sides of a polygon is always five. **[NCERT Exemplar]**
6. A square is a parallelogram.
7. A regular polygon has all its sides and angles equal. **[NCERT Exemplar]**

1. True	2. True	3. False	
4. False	5. False	6. True	7. True

I. Match the following

Column A	Column B
1. A polygon with six sides	a. $V + F = E + 2$
2. Euler's formula	b. Scalene
3. Triangle with all sides' length different	c. 360°
4. Sum of all angles of a rhombus	d. Hexagon
5. Triangles with all angles equal	e. Equilateral

1. (d)	2. (a)	3. (b)	4. (c)	5. (e)

III. Match the following

Column I		Column II	
a.	3 sides of equal length	**i.**	Obtuse angle
b.	1 right angle	**ii.**	Right angled
C.	2 sides of equal length	iii.	Equilateral
d.	1 obtuse angle	iv.	Isosceles

a. (iii)	b. (ii)	c. (iv)	d. (i)

I. Very short answers type questions.

1. Is it possible for the same:

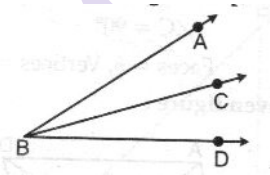
Line segments to have two different lengths?

Angle to have two different measures?

(a) No, it is not possible that same line segments have two different lengths.

(b). No, it is not possible that same angles have two different measures.

2. Will the measure of $\angle ABC$ and of $\angle ABC$ and of $\angle CBD$ make measure of $\angle ABD$ in Fig.



Yes, the measure of $\angle ABC$ and of $\angle CBD$ make measure of $\angle ABD$, because

$\angle ABD = \angle ABC + \angle CBD$.

3. Find out the incorrect statement, if any in the following:
Any angle is formed when we have

a. Two rays with a common end-point

b. Two line segments with a common end-point

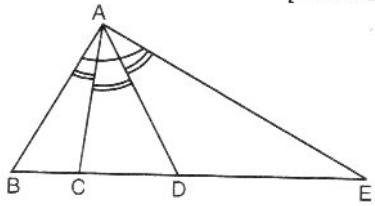
c. A ray and a line segment with a common end-point.

(b) and (c).

4. If two rays intersect will their point of intersection be the vertex of an angle of which the rays are two sides?

No, it is not possible.

5. An angle is said to be trisected, if it is divided into three equal parts. If in Fig., $\angle BAC = \angle CAD = \angle DAE$. How many trisectors are the there for $\angle BAE$?



Two, AC and AD.

6. **How many edges, faces and vertices are there in a sphere?**

Sphere, has no edges, no faces and no vertices.

II. Very short answers type questions.

1. **Why is it better to use a divider than a ruler, while measuring the lengths of a line segment?**

It's better to use a divider because accurate measurement will be possible.

2. **What is the disadvantage in comparing line segments by mere observation?**

The disadvantage is that there are chances of error due to improper viewing.

3. **Draw any line segment, say $\overline{AB}$. Take any point C lying in between A and B. Measure the lengths of AB, BC and AC. Is AB = AC + CB?**

Yes. (because C is between A and B).

4. **An angle is formed by two adjacent fingers. What kind of angle will it appear?**

Acute angle.

5. **A ship sailing in river Jhelam moves towards East. If it changes to North, through what angle does it turn?**

90^0.

6. **Look at your watch face. Through how many right angles does the minute – hand moves between 8 o'clock and 10 o'clock?**

8

7. **The measures of two angles of a triangle are 72^0 and 58^0. Find the measure of the third angle.**

The measure of third angle = $180^0 - (72^0 + 58^0) = 50^0$

8. **One of the acute angles of a right triangle is 50^0. Find the other acute angle.**

The other acute angle = $180^0 - (90^0 + 50^0) = 40^0$

9. **Let $\overline{PQ}$ be the perpendicular to the line segment $\overline{XY}$. Let $\overline{PQ}$ and $\overline{XY}$ intersect in the point A. What is the measure of $\angle$PAY?**

90^0

10. An angle is said to be trisected, if it is divided into three equal parts. If in Fig. 5.6, ∠BAC = ∠CAD = ∠DAE, how many trisectors are there for ∠BAE?

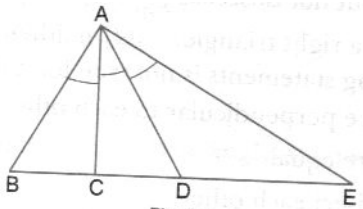


Fig. 5.6

Two trisectors : AC and AD

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

Square.

III. Very short answers type

1. What is the distance between the end points of a line segment.

We know that, the distance between the end points of a line segment is its length.

2. What is one revolution?

One full turn of clock hand is one revolution.

3. What is an obtuse angle?

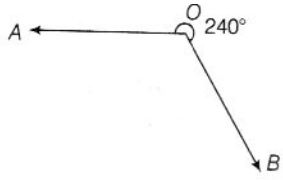
An angle is greater than a right angle but less than straight angles is called an obtuse angle.

4. Find the measure of a straight angle?

The measure of a straight angle is 180°.

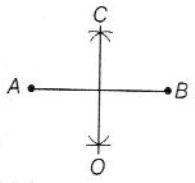
5. Draw a rough sketch of a reflex angle.

Here, $\angle AOB$ = 240°, which is a reflex angle.



6. What is the perpendicular bisector of a line segment?

A line perpendicular to the line segment that divides it into two equal parts is perpendicular bisector of the line segments.



Here, $\overline{CO}$ is a perpendicular bisector of $\overline{AB}$.

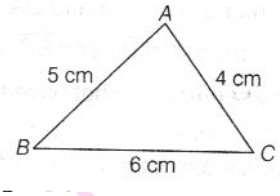
7. Write the name of triangle, whose each angle is acute.

It is an acute angled triangle.

8. Write the name of triangle, whose all three sides are unequal in length.

A triangle which has all unequal sides is scalene triangle.

Here, ΔABC is a scalene triangle.



Where, $AB \neq BC \neq CA$

9. Write the name of polygon, which has 5 sides.

A polygon which has 5 sides is pentagon.

10. Find the number of sides in a quadrilateral. What can you say about the number of angles? Is it greater than the number of sides?

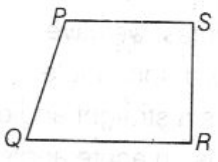
Number of sides in a quadrilateral = 4

and number of angles is also = 4

No, it is same as the number of sides.

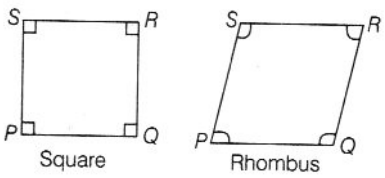
11. If in a quadrilateral, one pair of opposite sides are parallel, then what is the name of such quadrilateral?

If one pair of opposite sides are parallel, then it is a trapezium. i.e., $PS \parallel QR$



12. What is the difference between a square and a rhombus?

In a square, all angles are right angle whereas, in rhombus angles may right angle or not.



13. Can you tell any three name of three dimensional solids?

Three dimensional solids are cube, cuboid and sphere.

14. Write the number of faces, vertices and edges in a cuboid.

In a cuboid,

Faces = 6, Vertices = 8 and edges = 12

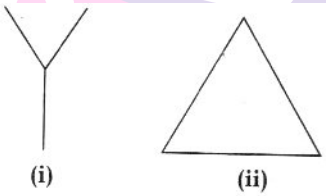
15. Write the number of faces, vertices and edges in a triangular prism?

In a triangle prism,

Faces = 3, Vertices = 6 and edges = 9

I. Short answers type questions.

1. What is common in the following figures: (i) and (ii)?
Is Fig. (i) that of triangle? If not, why?



(i) Both figures have 3 line segments, which is the common in both figures.

(ii) No, fig. (i) is not a triangle as it is not a closed figure.

2. Can we have two obtuse angles whose sum is:

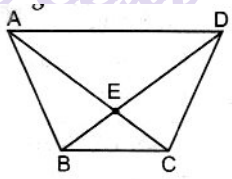
a. A reflex angle? Why or why not?

b. A complete angle? Why or why not?

a. Yes, the sum of two obtuse angles is always greater than 180°.

b. No, the sum of two obtuse angles is always greater than 180°but less than 360°.

3. In the given figure:



a . What is AE + EC?

b. What is AC – EC?

c. What is BD – BE?

d. What is BD – DE?

a. $AE + EC = AC$

b. $AC - EC = AE$

c. $BD - BE = ED$

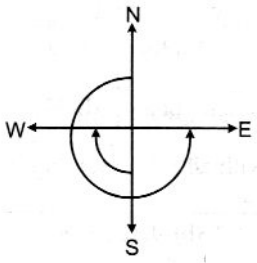
d. $BD - DE = BE$

4. How many right angles do you make, if you start facing:

a. South and turn clockwise to west?

b. North and turn anti-clockwise to east?

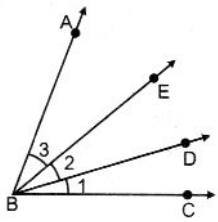
a. 1 right angle



b. 3 right angle

II. Short answers type questions.

1. Name the following angles of Fig. using three letters:



a) $\angle 1$ **b)** $\angle 2$ **c)** $\angle 3$ **d)** $\angle 1 + \angle 2$

e) $\angle 1 + \angle 2 + \angle 3$ **f)** $\angle CBA - \angle 1$

$\angle 1 = \angle CBD$

$\angle 2 = \angle DBE$

$\angle 3 = \angle EBA$

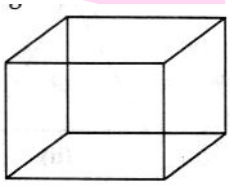
$\angle 1 + \angle 2 = \angle CBA$

$\angle 1 + \angle 2 + \angle 3 = \angle CBA$

$\angle CBA - \angle 1 = \angle DBA$

2. (i) If $\angle A$ = 30° and B = 60° of ΔABC, then measure $\angle C$.

(ii) Write the faces and vertices of cuboid as shown in the figure.



Cuboid

(i) Since, $\angle A$ = 30°, $\angle B$ = 60°

We know that the sum of all angles of a triangle is 180°, then

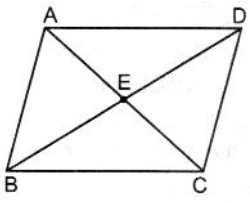
$$\angle A + \angle B + \angle C = 180°$$
$$30° + 60° + \angle C = 180°$$
$$90° + \angle C = 180°$$

or $\angle C = 180° - 90°$

$$\angle C = 90°$$

(ii) Faces = 6, Vertices = 8

3. In the given figure:



a. Name any four angles that appear to be acute angles.

b. Name any two angles that appear to be obtuse angles.

a. Four acute angles are: $\angle AEB, \angle ADE, \angle BAE \text{ and } \angle BCE$

b. Two obtuse angles are: $\angle BCD \text{ and } \angle BAD$.

4. In the given figure:

a. Is AC = CB = AB?

b. Is AB + AC = CB?

c. Is AB + BC = CA?

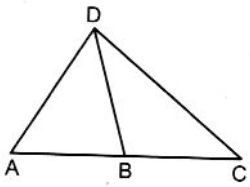
a. Yes, $i.e., AC + CB = AB$

b. No, $i.e., AB + AC \neq CA$

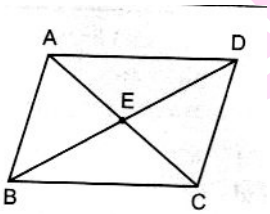
c. No, $i.e., AB + BC \neq CA$.

5. What conclusion can be drawn from each part of figure, if:

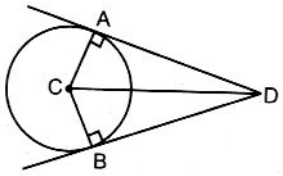
a. DB is the bisector of $\angle ADC$?



b. BD bisects $\angle ABC$?



c. DC is the bisector of $\angle ADB, CA \perp DA$ and $CB \perp DB$?



a. Yes, DB is the bisector of $\angle ADC\ i.e., \angle ADB = \angle CDB$.

b. Yes, BC bisects $\angle ABC\ i.e., \angle ABD = \angle CBD$.

c. Yes, DC is the bisector of $\angle ADB\ i.e., \angle ADC = \angle BDC$ and $\angle CAD = 90°, \angle CBD = 90°$

III. Short answers type questions.

1. Verify, whether D is the mid point of $\overline{AG}$

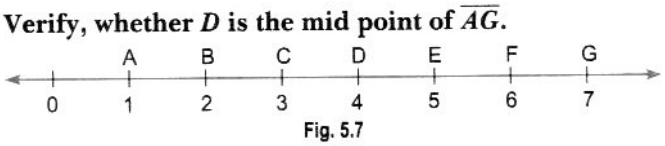


Fig. 5.7

Sol. Here, D is the mid point of $\overline{AG}$ because

AD = 3

DG = 3

i.e., AD=DG=3

2. If B is the mid point of $\overline{AC}$ and C is the mid point of $\overline{BD}$, where A,B,C,D lie on a straight line, say why AB = CD?

We have,

B is mid point of

So, $\overline{AB} = \overline{BC}$

Similarly, C is mid point of $\overline{BD}$,

So, $\overline{BC} = \overline{CD}$

Therefore, $\overline{AB} = \overline{CD}$

3. What is the measure of (i) a right angle? (ii) a straight angle?

i) Right angle = 90^0

ii) Straight angle = 180^0

4. Write down the measures of

i) Some acute angles

ii) Some obtuse angles

(give at least two examples of each).

Sol. i) Acute angles : 9^0, 54^0 and 81^0.

ii) Obtuse angles : 94^0, 144^0, 179^0.

5. In Fig. 5.8, [NCERT Exemplar]

i) Name any four angles that appear to be acute angles.

ii) Name any two angles that appear to be obtuse angles.

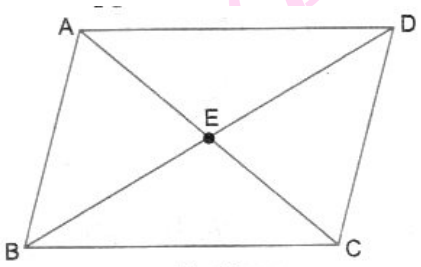


Fig. 5.8

i) Four acute angles are ∠AEB, ∠ADE, ∠BAE, ∠BCE.

ii)Two obtuse angles are ∠BCD, ∠BAD.

6. Which angle has a large measure? First estimate and then measure.

Measure of Angle A= Measure of Angle B =

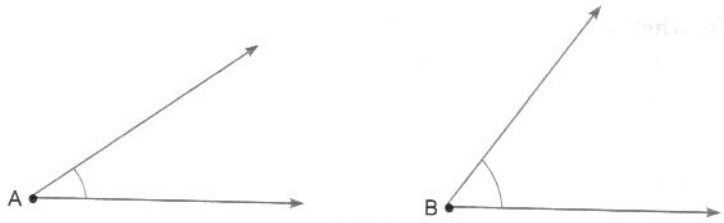


Fig. 5.9

Clearly, by estimation angle B has large measure as compared to angle A.

Measure of Angle A= 40^0 and Measure of angle B = 65^0.

7. From these two angles which has larger measure? Estimate and then confirm by measuring them. [NCERT]

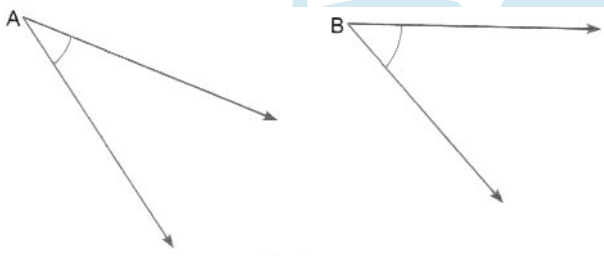


Fig. 5.10

Clearly, by estimation measure of angle B is greater than that of angle A.

Measure of angle A = 45^0

Measure of angle B = 55^0

8. Can we have two obtuse angles whose sum is

i)A reflex angle? Why or why not?

ii) A complete angle? Why or why not?

i) Yes, because sum of two obtuse angles is greater than 180^0.

ii) No, because sum of two obtuse angles is greater than 180^0 but less than 360^0.

9. Find the angle measure between the hands of the clock in each figure: [NCERT]

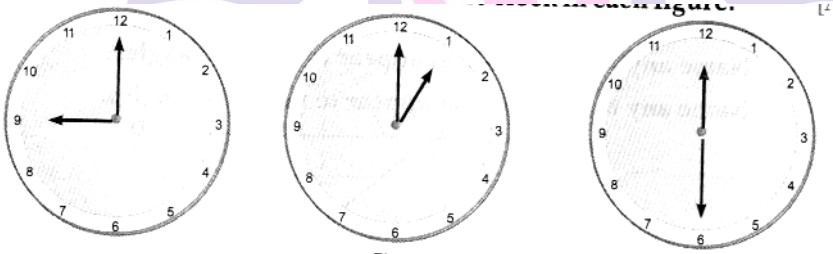


Fig. 5.11

Angle measure of clock (a) is 90^0

Angle measure of clock (b) is 30^0

Angle measure of clock © is 180^0

10. **The angles of a triangle are in the ratio 1 :3 : 5. Find the measure of each of the angles**.

Let the measure of given angle be $(1x)^0$, $(3x)^0$ and $(5x)^0$.

Then, $1x + 3x + 5x = 180^0$

$9x = 180^0$

$x = 20^0$

$3x = 3 \times 20^0 = 60^0$

$5x = 5 \times 20^0 = 100^0$

Hence, the measure of angles of given triangle are 20^0, 60^0, 100^0.

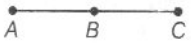
11. Match the following:

i) Straight angle	a) Less than one-fourth a revolution
ii) Right angle	b) More than half a revolution
iii) Acute angle	c) Half of a revolution
iv) Obtuse angle	d) One-fourth of a revolution
v) Reflex angle	e) Between ¼ and ½ of revolution
	f) One complete revolution.

i) c ii) d iii) a iv) e v) b

IV. Short answers type questions.

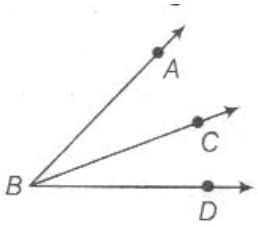
1. Will the lengths of line segment AB and line segments BC make the length of line segment AC in figure?



Here, $\overline{AB} + \overline{BC} = \overline{AC}$

Hence, the length of line segment $\overline{AB}$ and $\overline{BC}$ make the length of line segment $\overline{AC}$.

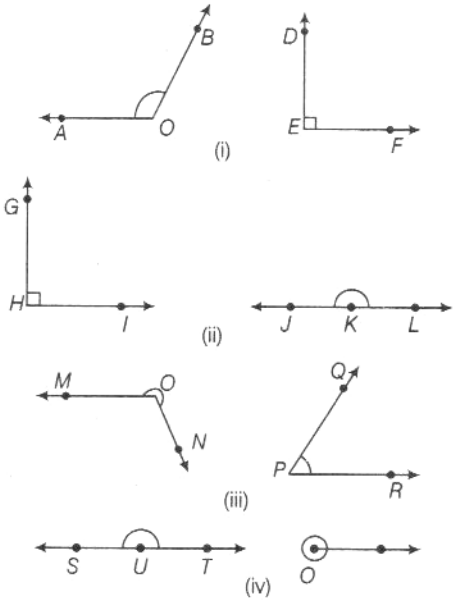
2. Will the measure of $\angle ABC$ and $\angle CBD$ make the measure of $\angle ABD$ in figure?



Here, $\angle ABD = \angle ABC + \angle CBD$

Hence, the measure of $\angle ABC$ and $\angle CBD$ make the measure of $\angle ABD$.

3. By simply looking at the pair of angles given below. State which of the angles in each pair is greater.



From the given figures, we can say that

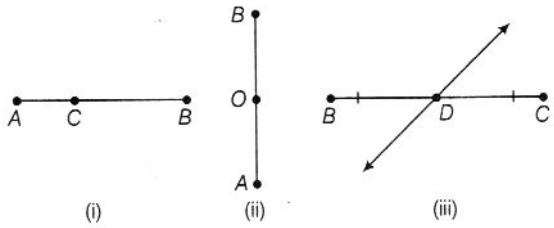
$\angle AOB > \angle DEF$

$\angle JKL > \angle GHI$

Reflex angle $\angle MON < \angle QPR$

$\angle O > \angle SUT$

4. Which points in figure, appear to be mid-point of the line segments? When you locate a mid-point, name the two equal line segments formed by it.



In the figure.

There is no mid-point in $\overline{AB}$.

i) O is the mid-point of $\overline{AB}$ and $\overline{OA} = \overline{OB}$

ii) D is the mid-point of $\overline{BC}$ and $\overline{BD} = \overline{CD}$

5. Is it possible for the same

a) Line segment to have two different lengths?

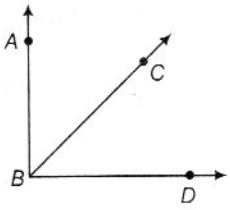
b). Angle to have two different measures?

(a) No, a line segment cannot have two different lengths.

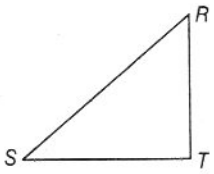
(b). No, an angle cannot have two different measurements.

6. **Using the information given, name the right angles in each part of figure.**

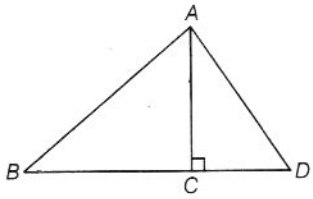
(a) $BA \perp BD$



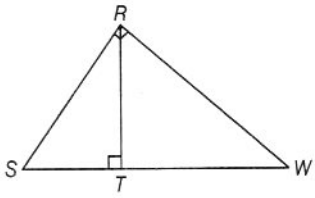
(b) $RT \perp ST$



(c) $AC \perp BD$



(d) $RS \perp RW$



The right angles in each part of the given figure are as follow:

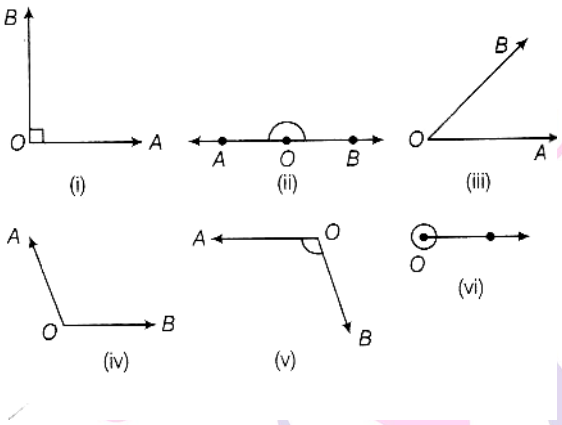
a. $\angle ABD$ = 90°

b. $\angle RTS$ = 90°

c. $\angle ACD = \angle ACB$ = 90°

$d. \angle SRW = \angle RTS = \angle RTW$ = 90°

7. State the type of angle given below.



In the given figures, we have

a. $\angle AOB$ is a right angle.

b. $\angle AOB$ is a straight angle.

$c.\angle AOB$ is an acute angle.

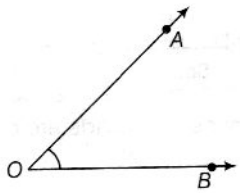
$d.\angle AOB$ is an obtuse angle.

$e.\angle AOB$ is an obtuse angle.

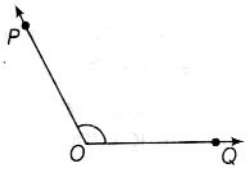
f. $\angle O$ is a complete angle.

8. Using a ruler only, draw an acute, obtuse and reflex angle.

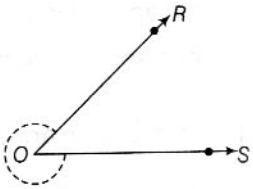
a. Acute $\angle AOB$



(b) Obtuse $\angle POQ$



(c) Reflex $\angle ROS$



9. Convert the following angles of degrees into fractional right angle.

a. 10° (b) 20° (c) 135°

We know that, 1 right angle = 90°

i.e., $1° = \frac{1}{90}$ right angle

a. $10° = \frac{10°}{90°} = \left(\frac{1}{9}\right)$ right angle

b. $20° = \frac{20°}{90°} = \left(\frac{2}{9}\right)$ right angle

c. $135° = \frac{135°}{90°} = \left(\frac{3}{2}\right)$ right angle

10. Convert the following into degree.

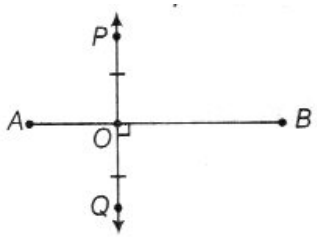
$a.\ \frac{2}{9}$ right angle b. $\frac{3}{4}$ right angle

We know that, 1 right angle = 90°

$a.\frac{2}{9}$ right angle $= \frac{2}{9} \times 90° = 20°$

$b.\frac{3}{4}$ right angle $\frac{3}{4} \times 90° = 67.5°$

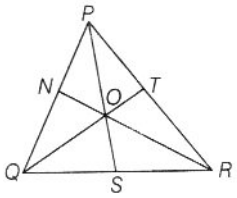
11. In the given figure, $PQ, \perp AB$ and $PO = OQ$. IS PQ, the perpendicular bisector of line segment AB? Why or why not?



PQ is not the perpendicular bisector of line segment AB because $AO \neq BO$. [AB is the perpendicular bisector of line segment PQ].

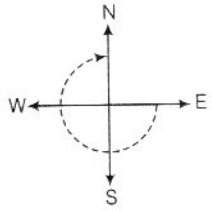
12. Draw any triangle of your choice, then draw all the three medians. Are they passing through one point?

Sol. According to the given information, ΔPQR has medians $\overline{PS}, \overline{QT}$ and $\overline{RN}$. Yes, these medians passing through one point 'O'.



13. Which direction will you face, if you start facing East and make $\frac{3}{4}$ of a revolution clockwise?

We face towards North.

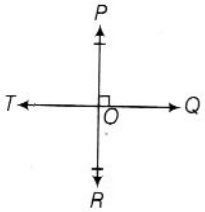


14. If each side of a triangle is 6 cm. name the type of triangle.

Given that, each side of a triangle is 6 cm. Hence, it is an equilateral triangle.

15. Find the measure of $\angle POQ$, if $PR \perp QT$.

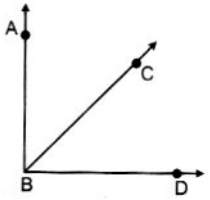
Here, $\angle POQ$ = 90°



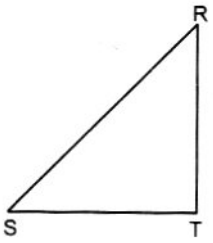
I. Long answers type questions.

1. Using the information given, name the right angles in each part Fig. $(a-h)$.

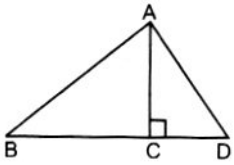
a. $BA \perp BD$



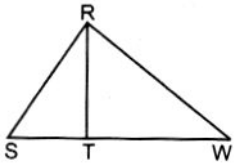
b. $RT \perp ST$



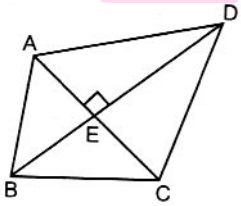
c. $AC \perp BD$



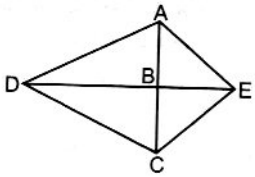
d. $RT \perp SW$



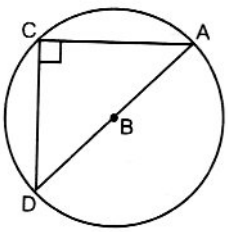
e. $AC \perp BD$



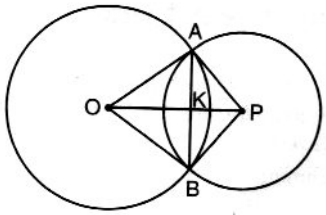
f. $AE \perp CE$



g. $AC \perp CD$



h. $OP \perp AB$



ABD

$\angle RTS$

$\angle ACD$ and $\angle ACB$

$\angle RTW$ and $\angle RTS$

$\angle AED, \angle AEB, \angle BEC$ and $\angle DEC$

$\angle AEC$

$\angle ACD$

$\angle AKO, \angle AKP, \angle BKO$, and $\angle BKP$

2. Can we have two acute angles whose sum is:

a. A right angle? Why or why not?

b. An obtuse angle? Why or why not?

c. A straight angle? Why or why not?

d. A reflex angle? Why or why not?

a. Yes, the sum of two acute angles may be equal to a right angle.

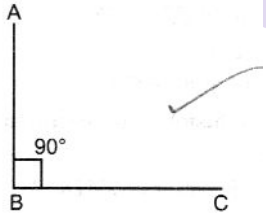
b. Yes, the sum of two acute angles may be more than a right angle.

c. No, the sum of two acute angles is always less than 180°.

d. No, the sum of two acute angles is always less than 180°.

3. Construct an angle of 90° with the help of a protractor.

Steps of construction:



1. Draw a line segment BC.

2. Make an angle of 90° with the help of protractor.

3. Hence $\angle ABC$ = 90°.

II Long Answer Questions

1. Classify each one of the following angles as right, acute, obtuse or reflex: [NCERT]

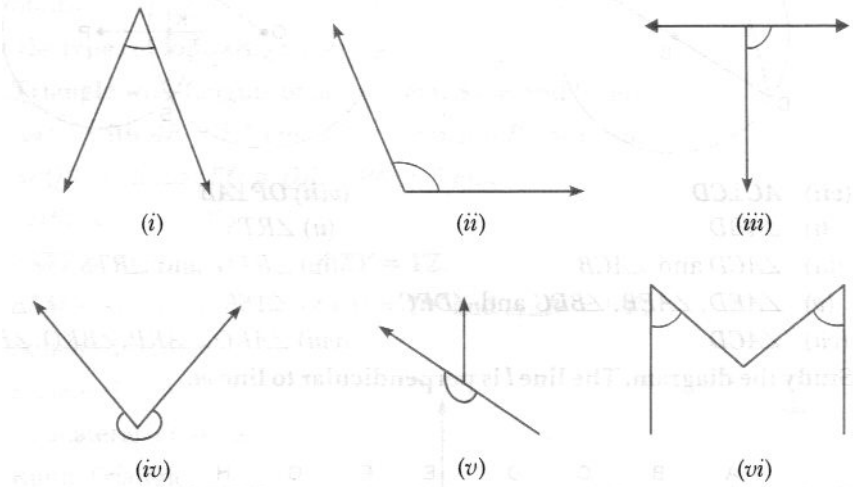
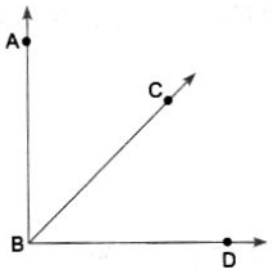


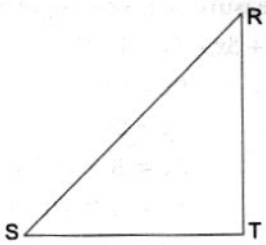
Fig. 5.12

i) Acute ii) Obtuse iii) Right iv) Reflex v) Straight vi) Acute

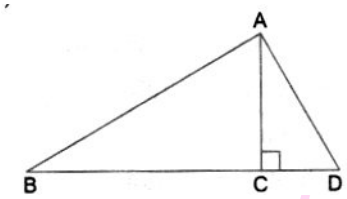
2. Using information given, name the right angles in each part of figure:

[NCERT Exemplar]

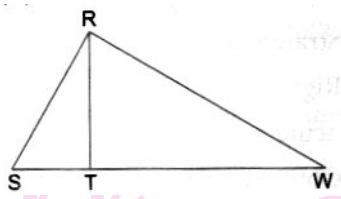




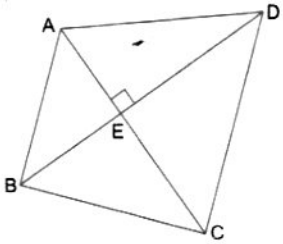
i) BA ⊥ BD



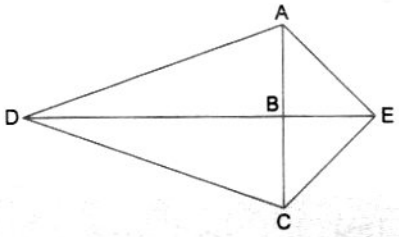
ii) RT ⊥ ST



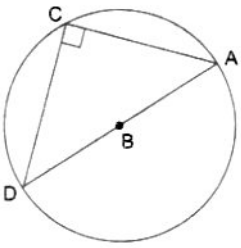
iii) AC ⊥ BD



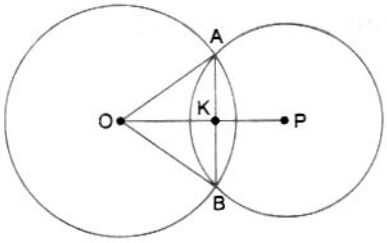
iv) RT⊥ SW



v) AC ⊥ BD



vi) AE ⊥ CE



vii) AC ⊥ CD

viii) OP⊥ AB

i) ∠ABD

ii) ∠RTS

iii) ∠ACD and ∠ACB

iv) ∠RTW and ∠RTS

v) ∠AED, ∠AEB, ∠BEC and ∠DEC

vi) ∠ AEC

vii) ∠ACD

viii) ∠AKO, ∠AKP, ∠BKO, ∠BKP

3. Study the diagram. The line l is perpendicular to line m. [NCERT]

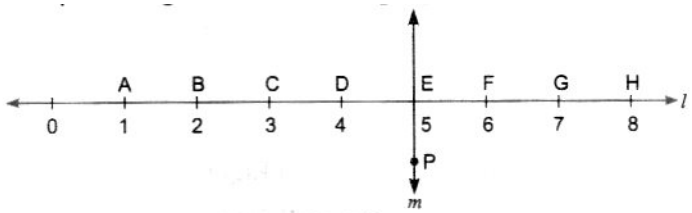


Fig. 5.13

i) Is CE = EG?

ii) Does PE bisect CG?

iii) Identify any two line segments for which PE is the perpendicular bisector

iv) Are these true?

a) AC > FG b) CD = GH c) BC = EH.

i) yes

ii) Yes

iii) $\overline{BH}$, $\overline{DF}$

iv) All are true.

4. **In Fig. 5.14,** [NCERT Exemplar]

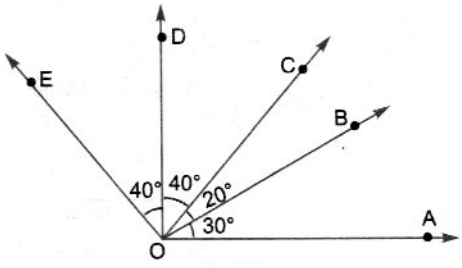


Fig. 5.14

i) AOD is a/an _____ angle.

ii) COD is a/an _____ angle.

iii) AOE is a/an _____ angle.

i) Right ii) acute iii) obtuse

5. Name the types of following triangles: [NCERT]

i) Triangle with lengths of sides 7 cm, 8 cm and 9 cm.

ii) ΔABC WITH AB = 8.7 cm, AC = 7 cm and BC = 9 cm

iii) ΔPQR such that PQ = QR = PR =5 cm.

iv) ΔDEF with = 90^0.

v) ΔXYZ with $m\angle Y = 90^0$ and XY = YZ.

vi) ΔLMN with $m\angle L = 30^0$, $m\angle M = 70^0$ and $m\angle N = 80^0$.

i) Scalene Triangle

ii)Scalene Triangle

iii)Equilateral Triangle

iv)Right Triangle

v) Isosceles right triangle

vi)Acute angled triangle

6. Name each of the following triangles in two different ways: (you may judge the nature of the angle by observation)

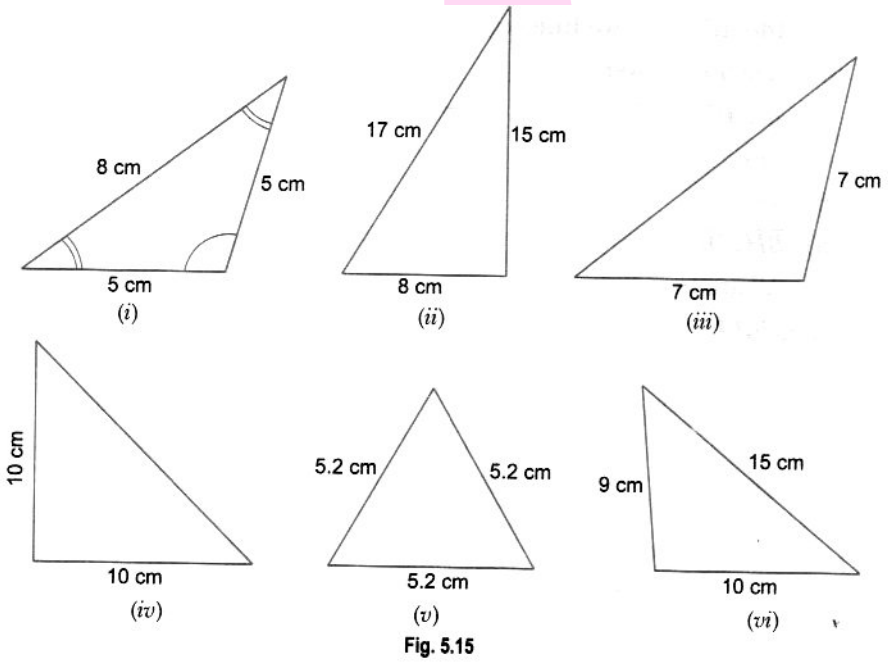


Fig. 5.15

(i) Acute angled and isosceles.

(ii) Right angled and scalene.

(iii) Obtuse angled and isosceles.

(iv) Right angled and isosceles.

(v) Equilateral and acute angled.

(vi) Obtuse angled and scalene.

7. Give reasons of the following:

(i) A square can be thought of as a special rectangle.

(ii) A rectangle can be thought of as a special parallelogram.

(iii) A square can be thought of as a special rhombus.

(iv) Squares, rectangles, parallelograms are all quadrilaterals.

(v) Square is also a parallelogram.

(i) A square can be thought as special rectangle as rectangle with all sides equal becomes a square.

(ii) A rectangle can be a parallelogram as parallelogram with each angle a right angle becomes a rectangle.

(iii) A square can be thought of as rhombus as rhombus with each angle a right angle becomes a square.

(iv) Square rectangles, parallelogram are quadrilaterals as all these four sides polygons made of line segments.

(v) Square is a parallelogram as opposite sides of square are parallel, so it is parallelogram.

8. Examine whether the following are polygons. If any one among them is not, say why?

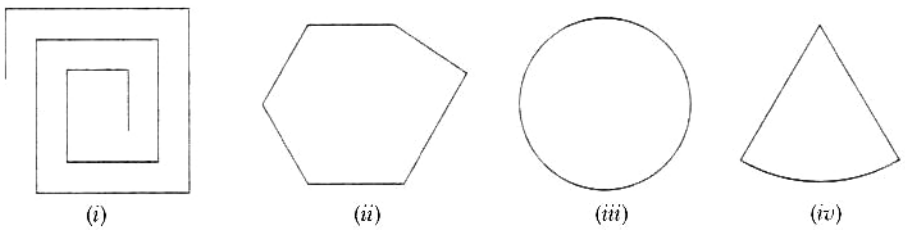


Fig. 5.16

(i) It is not a closed figure hence it is not a polygon.

(ii) It is a polygon of six sides.

(iii) It's not a polygon as it is not made of line segments.

(iv) It's not a polygon as it is not made of line segments.

9. In Fig. 5.17, points A, B, C, D and E are collinear such that $AB = BC = CD = DE$. Then

(i) $AD = AB +$ _____

(ii) $AD = AC +$ _____

(iii) **Mid point of AE is** _____

(iv) **Mid point of CE is** _____

(v) $AE =$ _____ $\times AB$.

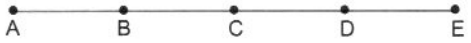


Fig. 5.17

(i) BD (ii) CD (iii) C (iv) D (v) 4

10. Write the name of

(i) **Vertices**

(ii) **Edges, and**

(iii) **Faces of the prism shown in Fig. 5.18.**

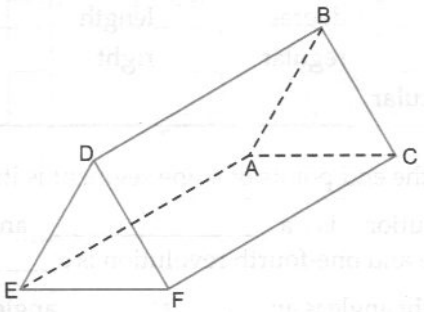


Fig. 5.18

(i) Vertices A, B, C, D, E, F.

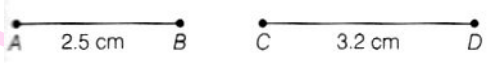
(ii) Edges $AB, AC, BC, BD, DF, FC, EF, ED, AE$.

(iii) Faces $ABC, DEF, AEFC, AEDB, BDFC$.

III. Long answers type questions.

1. Construct two line segments AB and CD lengths 2.5 cm and 3.2 cm. construct another segment EF, whose length is the sum of these two segments. Measure the new length. [HOTS]

Sol. Now, first of all, we draw AB = 2.5 cm and CD = 3.2 cm



$\overline{AB} + \overline{CD} = \overline{EF}$

Now, we have to draw a line segment

$\therefore \overline{EF} = \overline{AB} + \overline{CD}$ = 2.5 + 3.2 = 5.7 cm

Hence, new length is 5.7 cm.

2. Name the type of triangle and also draw it rough sketch.

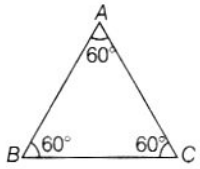
a. ΔABC: $\angle A = \angle B = \angle C = 60°$

b. ΔABC: $\angle B = \angle C = 50°$

c. ΔABC: $\angle A = 45°, \angle B = 45°, \angle C = 90°$

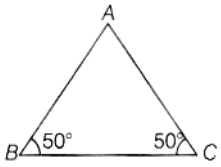
d. ΔABC: $\angle A = 50°, \angle B = 60°, \angle C = 70°$

a. Given, $\angle A = \angle B = \angle C = 60°$



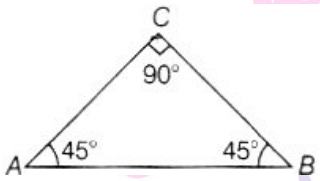
Hence, it is an equilateral triangle.

a. Given, $\angle B = \angle C = 50°$



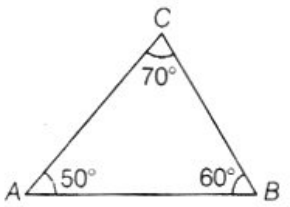
Hence, it is an isosceles triangle.

b. Given, $\angle A = 45°, \angle B = 45°, \angle C = 90°$



Hence, it is an isosceles triangle.

a. Given, $\angle A = 50°, \angle B = 60°, \angle C = 70°$



Hence, it is a scalene triangle.

3. Name the type of triangle, if

a. Sides are 7 cm, 8 cm and 9 cm

$\boldsymbol{b.\ \Delta ABC; AB = AC = 6\ cm, BC = 8\ cm}$

$\boldsymbol{c.\ \Delta ABC; AB = BC = AC = 5\ cm}$

$\boldsymbol{d.\ \Delta ABC; \angle B = 90°, BC = 4\ cm, AB = 3\ cm}$

a. Given, sides are 7 cm, 8 cm and 9 cm.

Hence, it is a scalene triangle.

b. Given, in $\Delta ABC; AB = AC = 6\ cm, BC = 8\ cm$

Hence, it is an isosceles triangle.

c. Given, $\Delta ABC; AB = BC = AC = 5\ cm$

Hence, it is an equilateral triangle.

d. Given, in $\Delta ABC; \angle B = 90°, BC = 4\ cm, AB = 3\ cm$

Hence, it is a right angled triangle.

4. Take three non-collinear points (A,B,C) on your notebook, Join AB, BC, CA. What type of figure do you get? If it is a triangle, name the following

a. Side opposite to $\angle B$.

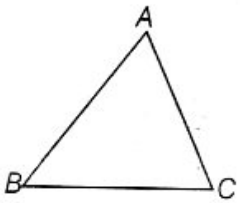
b. Angle opposite to side AC.

c. Vertex opposite to side BC.

d. Side opposite to vertex A and B.

Given, three non-collinear points A, B and C.

Now, after joining AB, BC and CA, we get a ΔABC.



Then, we have

a. Side opposite to $\angle B$ is AC.

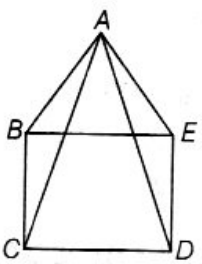
b. Angle opposite to side AC is $\angle B$.

c. Vertex opposite to side BC is A.

d. Side opposite to vertex A and B is BC and AC respectively.

5. In figure, BCDE is a square and a 3-D shape has been formed by joining the point A in shape with the vertices B,C,D and E. Name the 3-D shape and also its (i) vertices, (ii) edges and (iii) faces.

The 3-D shape formed is a square pyramid.



i. Vertices are A, B, C, D and E.

ii. Edges are $AB, AC, AD, AE, BC, CD, DE$ and ED.

iii. Faces are: square $BCDE, \Delta ABC, \Delta ACD, \Delta ADE$ and ΔABE.

6. During Maths lab activity, each students was given four broom sticks of length 8 cm, 8 cm, 5 cm, 5 cm to make different types of quadrilaterals.

a. How many quadrilaterals can be formed using four broom sticks?

b. Name the types of quadrilateral formed.

c. While doing this activity, which value is depicted?

Given, four broom sticks of length 8 cm, 8 cm, 5 cm and 5 cm.

a. Three types of quadrilaterals can be formed.

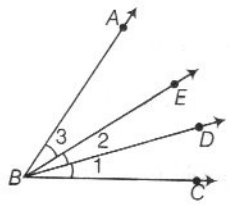
b. Name of the quadrilaterals are rectangle, parallelogram and kite.

c. The value is scientific, temper and curiosity.

7. Name the following angles of figure using three alphabets.

a. **$\angle 1$** **b. $\angle 2$** **c. $\angle 3$** **d. $\angle 1 + \angle 2$** **e. $\angle 2 + \angle 3$**

f. $\angle 1 + \angle 2 + \angle 3$ **g. $\angle CBA - \angle 1$**



Name of the angles are as follows:

a. $\angle 1 = \angle CBD$ b. $\angle 2 = \angle DBE$

c. $\angle 3 = \angle EBA$ d. $\angle 1 + \angle 2 = \angle CBE$

e. $\angle 2 + \angle 3 = \angle DBE$ f. $\angle 1 + \angle 2 + \angle 3 = \angle CBA$

g. Put the value of $\angle CBA$

[$\therefore \angle CBA = \angle 1 + \angle 2 + \angle 3$]

Now, $\angle CBA - \angle 1 = \angle 1 + \angle 2 + \angle 3 - \angle 1$

$= \angle 2 + \angle 3 = \angle DBA$ $[\because \angle DBA = \angle 2 + \angle 3]$

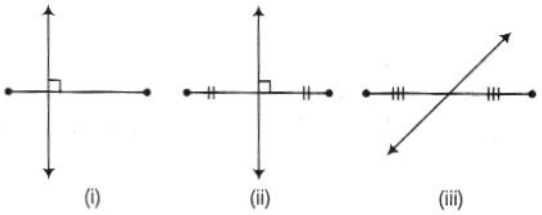
8. In which of the following figures?

a. Perpendicular bisector is show?

b. Bisector is show?

c. Only bisector is shown?

d. Only perpendicular is shown?



Sol.

(a) perpendicular bisector means, a line is perpendicular to the another line and divided it into two equal parts.

Here, in figure (ii), perpendicular bisector is shown.

(b) Bisector means, a line divides the another line in equal parts.

Here, in figure (ii) and (iii), bisector are shown.

(c) Only bisector is shown in figure (iii).

(d) Only perpendicular is shown in figure (i).

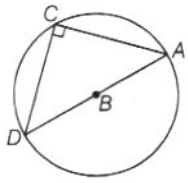
9. Using the information given, name the right angles in each part of figure.

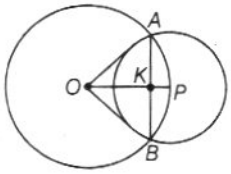
a. $\boldsymbol{AC \perp BD}$

b. $\boldsymbol{AE \perp CE}$

c. $\boldsymbol{AC \perp CD}$

d. $\boldsymbol{OP \perp AB}$





a. Since, $AC \perp BD$, it means $\angle E = 90°$.

$\therefore \angle AEB, \angle BEC, \angle CED$ and $\angle AED$ are right angles.

b. Since, $AE \perp CE$, it means $\angle E = 90°$

$\therefore \angle AEC$ is a right angle.

c. Since, $AC \perp CD$, it means $\angle C = 90°$

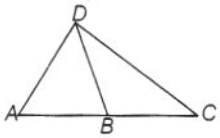
$\therefore \angle ACD$ is a right angle.

d. Since, $OP \perp AB$, it means $\angle K = 90°$

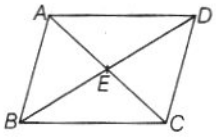
$\therefore \angle AKO, \angle OKB, \angle BKP$ and AKP are right angles.

10. What conclusion can be drawn in each part of figure?

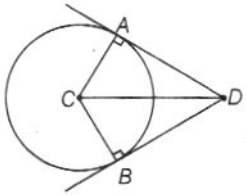
(a) *DB* is the bisector of $\angle ADC$.



(b) *BD* bisects $\angle ABC$.



(c) *DC* is the bisector of $\angle ADB$, $CA \perp DA$ and $CB \perp DB$.



We know that, bisector line divide that angle into two equal angles.

a. Since, BD is the bisector of $\angle ADC$

$\therefore \angle ADB = \angle BDC$

b. Since, BD bisector $\angle ABC$,

$\therefore \angle ABD = \angle CBD$

c. Since, DC is the bisector of $\angle ADB$ and $CA \perp DA$ and $CB \perp DB$

$\therefore \angle ADC = \angle BDC$ and $\angle CAD = 90°$, $\angle CBD = 90°$.

I HOTS (Higher Order Thinking Skills)

1. Write the measure of the two angles formed by the hour and the minute hands of a clock at 4 o'clock. Also, write what types of angles these are?

Sol. At 4 o'clock, the hour hand is at 12 and the minute hand is at 4. Making two angles of 60° and 120°.

The two hands of the clock making an angle of 60° is an acute angle and the other angle of 120° is an obtuse angle.

2. What part of a revolution have you turned through if you stand facing

(i) East and turn clockwise to face North?

(ii) South and turn clockwise to face East?

(iii) West and turn clockwise to face East?

Sol.

(i) $\frac{3}{4}$

(ii) $\frac{3}{4}$

(iii) ½