Mathematics

Chapter 4: Basic Geometrical Ideas

Important Questions

Multiple Choice Questions:

1. A triangle has:
   - **A.** one element
   - **B.** two elements
   - **C.** 6 elements
   - **D.** none of these
2. A point where three or more lines meet is called:
   - **A.** point of concurrence
   - **B.** meeting point
   - **C.** collinear point
   - **D.** non-collinear point
3. What are used to represent points?
   - **A.** Numerals.
   - **B.** Capital letters of alphabet.
   - **C.** Lower case letters of alphabet.
   - **D.** All of the above
4. Which instrument is used to compare two line segments?
   - **A.** Compasses
   - **B.** A divider
   - **C.** Set squares
   - **D.** A protractor
5. A _____ of a circle is a line segment joining any two points on the circle.
   - **A.** chord
   - **B.** diameter
   - **C.** radius
   - **D.** None of these
6. A quadrilateral has:
   - **A.** one vertex
   - **B.** two vertices
   - **C.** three vertices

D. four vertices

7. The meeting point of a pair of adjacent sides of a polygon is called its:

A. vertex

B. diagonal

C. adjacent angles

D. none of these

8. An angle is made up of two _____ starting from common end point.

A. rays

B. vertices

C. lines

D. points

9. If two lines intersects each other then the common point between them is known as point of _____.

A. concurrence

B. intersection

C. vertex

D. contact

10. What is a set of points extending infinitely in all directions on the same flat surface called?

A. A line

B. A plane

C. Ray

D. A point

11. A quadrilateral has:

A. one diagonal

B. two diagonals

C. three diagonals

D. four diagonals

12. Three or more points are collinear if they lie on the:

A. same line

B. two lines

C. same surface

D. none of these

13. Flat surface in which two points are joined by using straight line is classified as:

A. line

B. plane

C. ray

D. intersecting line

14. What is the number of end points of a line?

A. Zero

B. Two

C. One

D. Three

15. Angle which is less than 90° is called

A. reflex angle

B. obtuse angle

C. acute angle

D. right angle

Match The Following:

	Column I		Column II
1.	Every circle has a point at	**A.**	Diameter
2.	Line segment passing through the centre of a circle	**B.**	Centre
3.	Half of the diameter	**C.**	Arc
4.	The path in the circle formed from two points on the circle	**D.**	Radius

Fill in the blanks:

1. _____ has no length, breadth, height or thickness.
2. A line segment has a definite _____ .
3. Curves that do not intersect themselves are called _____ curves.
4. An 'angle' is made up of _____ rays having a common end point.

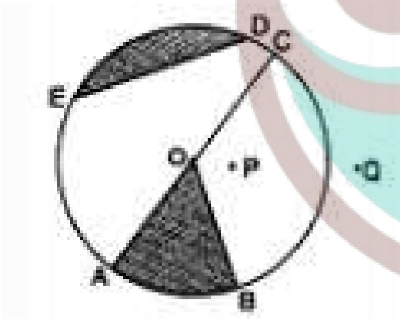
True /False:

1. A point indicates a definite position.
2. A line segment is a part of a plane.
3. A line is a set of points closely arranged.

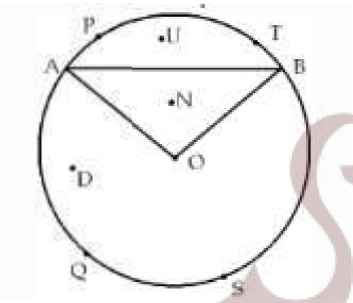
4. Two lines in a plane always intersect in a point.

Very Short Questions:

1. Draw rough diagrams to illustrate the following:
   a. Open curve.
   b. Closed curve.
2. How many end points a line segment have?
3. Illustrate, if possible, each one of the following with a rough diagram:
   a. A closed curve that is not a polygon.
   b. An open curve made up entirely of line segments.
   c. A polygon with two sides.
4. From the figure identify
   a. the center of circle.
   b. three radii
   c. a diameter

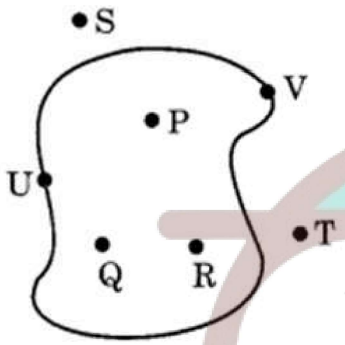


5. Write the points which are:

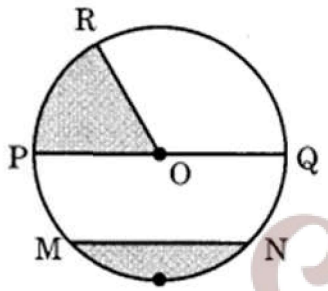


   i. in the minor sector OAPB
   ii. minor segment ATB
   iii. major sector OAQB
   iv. major arc AQB
   v. minor arc APB
6. Define the following terms:
   i. Line segment,
   ii. Line,
   iii. Intersecting lines,
   iv. Parallel lines

7. Draw a rough sketch of closed curve made up of line segments.
8. Draw two different angles having common point and a common arm.
9. Identify the points which are:
   (i) in the interior
   (ii) in the exterior
   (iii) on the closed curve in the given figure.

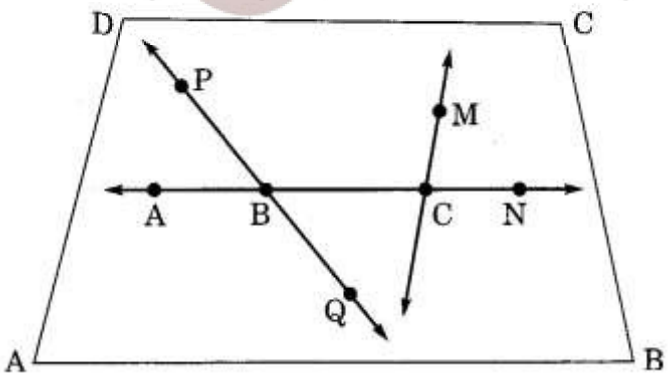


10. Identify the following in the given figure:
    (a) Sector
    (b) Chord
    (c) Diameter
    (d) Segment.



Short Questions:

1. Using the given figure, name the following:

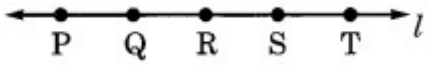


   (a) Line containing point M.
   (b) Line passing through four points.

(c) Line passing through three points.

(d) Two pairs of intersecting lines.

2. On the given line, some points are given, write down the names of all segments.



How many lines can pass through

(i) one given point?

(ii) two given points?

(iii) three non-collinear points+

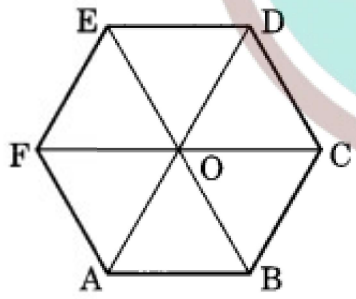
3. How many lines can pass through,

(i) one given point?

(ii) two given points?

(iii) three non-collinear points

4. Look at the given figure and answer the following:



(a) Name the sides of the polygon ABCDEF.

(b) Name any two pairs of adjacent sides. .

(c) Name all the segments which intersect each other at one point.

(d) Name all the diagonals of the given polygon.

Long Questions:

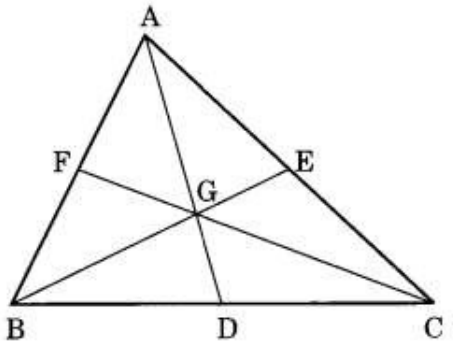
1. Draw the medians of a AABC and answer the following:

(a) Name the three medians.

(b) Do the medians intersect each other at the same point?

(c) What is that point called?

(d) Can this point be outside the triangle?



2. Draw an equilateral ΔABC of any size. Draw AD as its median and an altitude AM.

   (i) Does AD coincide with AM?

   (ii) Name the point on the median which divides it in the ratio 1:2.

   (iii) What is the measure of ∠ADC and ∠ADB?

   (iv) Are D and M the same points?

3. In the given figure, l, m and n are three parallel lines, x and y intersect these lines.

   (i) Name the points lying on the line x.

   (ii) Name the points lying on the line y.

   (iii) Name the points inside the quadrilateral ABED.

   (iv) Name the points outside the quadrilaterals ABED and BCFE.

   (v) Name the lines passing through three points.

Assertion and Reason Questions:

1.) Assertion (A) –The term 'Geometry' is the English equivalent of the Greek word 'Geometron'.

Reason (R) –'Geo' means Earth and 'metron' means Measurement.

a) Both A and R are true and R is the correct explanation of A

b) Both A and R are true but R is not the correct explanation of A

c) A is true but R is false

d) A is false but R is true

2.) Assertion (A) –All objects have different shapes.

Reason (R) –Even today geometrical ideas are reflected in all forms of art, measurements, architecture, engineering, cloth designing etc.

a) Both A and R are true and R is the correct explanation of A

b) Both A and R are true but R is not the correct explanation of A

c) A is true but R is false

d) A is false but R is true

ANSWER KEY -

Multiple Choice questions:

1. **C.** 6 elements
2. **A.** point of concurrence
3. **B.** Capital letters of alphabet.
4. **B.** A divider
5. **A.** chord
6. **D.** four vertices
7. **A.** vertex
8. **A.** rays
9. **B.** intersection
10. **B.** A plane
11. **B.** two diagonals
12. **A.** same line
13. **B.** plane
14. **A.** Zero
15. **C.** acute angle

Match The Following:

	Column I		Column II
1.	Every circle has a point at	**B.**	Centre
2.	Line segment passing through the centre of a circle	**A.**	Diameter
3.	Half of the diameter	**D.**	Radius
4.	The path in the circle formed from two points on the circle	**C.**	Arc

Fill in the blanks:

1. **Point** has no length, breadth, height or thickness.
2. A line segment has a definite **length**.
3. Curves that do not intersect themselves are called Simple curves.
4. An ‘angle’ is made up of **Two** rays having a common end point.

True /False:

1. True
2. False. A line segment is a part of a line that has two end points
3. False. A line is a straight path that is endless.
4. False. Two lines in a plane intersect in a point or parallel.

Very Short Answer:

1. (a) 

   (b) 
2. 2
3. (a) 

   (b) 

   (c) Not possible.
4. (a) O is the centre of the circle.

   (b) $\overline{OA}, \overline{OB}, \overline{OC}$ are three radii of the circle.

   (c) $\overline{AC}$ is the diameter of the circle.
5. i. U and N

   ii. U

   iii. D

   iv. A, Q, S and B

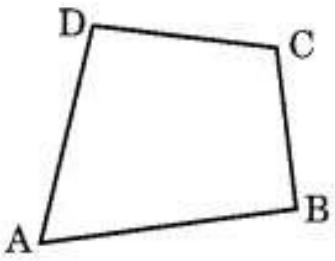
   v. A, P, T and B
6. **i. Line segment:** A straight line drawn from any point to any other point is called as line segment.

   ii. Line: Line is a straight path of points that goes on forever in two directions. It has infinite length, but no breadth and height.

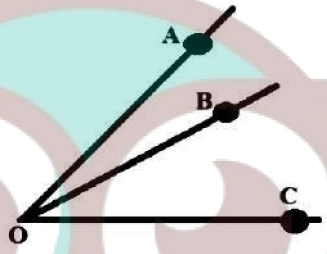
   iii. Intersecting lines: Interesting lines are lines that pass through the same point.

   iv. Parallel lines: Parallel lines are never cross and always stay the same distance apart.

7. Required curve is ABCD closed with the line segments $\overline{AB}, \overline{BC}, \overline{CD}$ and $\overline{DA}$



8. ∠AOB and ∠COB are two different angles with common point O and common arm $\overrightarrow{OB}$.



9. (i) Points P, Q and R are in the interior of the closed curve.

(ii) points S and T are in the exterior of the closed curve.

(iii) U and V are on the closed curve.

10. (a) OPR (shaded) is the sector of the circle.

(b) $\overline{MN}$ is the chord.

(c) $\overline{PQ}$ is the diameter.

(d) MXN (shaded) is the segment.

Short Answer:

1. (a) $\overleftrightarrow{MC}$ is the line containing the point M.

(b) $\overleftrightarrow{AN}$ is the line passing through four points A, B, C and N.

(c) $\overleftrightarrow{PQ}$ is the line passing through three points P, B and Q.

(d) Pairs for intersecting lines are

(i) $\overleftrightarrow{AN}$ and $\overleftrightarrow{PQ}$

(ii) $\overleftrightarrow{AN}$ and $\overleftrightarrow{MC}$

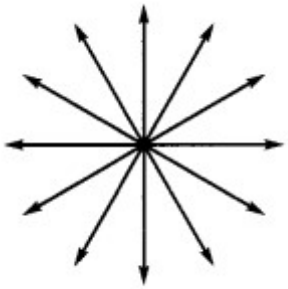
2. Segments are:

$\overline{PQ}, \overline{RP}, \overline{PS}, \overline{PT}, \overline{QR}, \overline{QS}, \overline{QT}, \overline{RS}, \overline{RT}, \overline{ST}$

3. (i) Infinite number of lines can be passed through one given point.

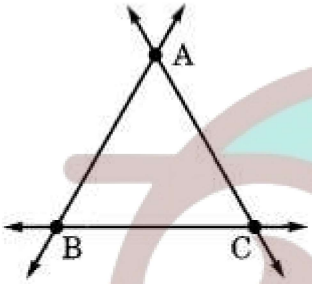
(ii) Only one line can pass through two given points.

(iii) Three lines can pass through three non- collinear points.



(i)

(ii)



(iii)

4. (a) The sides of the polygon are:

$\overline{AB}$, $\overline{BC}$, $\overline{CD}$, $\overline{DE}$, $\overline{EF}$ and $\overline{FA}$.

(b) $\overline{AB}$ and $\overline{BC}$, $\overline{BC}$ and $\overline{CD}$ are the pairs of adjacent sides.

(c) $\overline{AD}$, $\overline{BE}$ and $\overline{CF}$ intersect each other at O.

(d) Name of the diagonals are:

$\overline{AD}$, $\overline{BE}$ and $\overline{CF}$.

Long Answer:

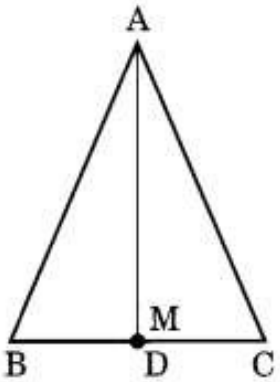
1. (a) Names of the medians are $\overline{AD}$, $\overline{BE}$ and $\overline{CF}$.

(b) Yes, the medians intersect each other at the same point G.

(c) The point of intersection of the medians of a triangle is called 'Centroid'.

(d) No, this point cannot be out of the triangle.

2. (i) Yes, AD coincides with AM.



(ii) The point on the median which divides it in the ratio 1: 2 is called centroid of the triangle.

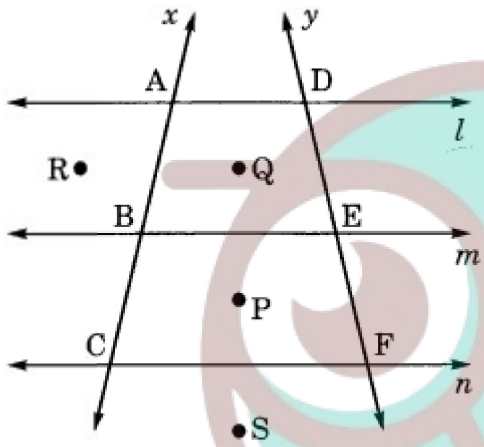
(iii) ∠ADC = ∠ADB = 90°

(iv) Yes, D and M are the same points.

3. (i) A, B and C lie on the line x.

(ii) D, E and F lie on the line y.

(iii) Q is the point inside ▢ABED



(iv) Points R and S are outside the quadrilaterals ABED and BCFE.

(v) Lines x and y pass through the three points A, B, C and D, E, F respectively.

Assertion and Reason Answers:

1) b) Both A and R are true but R is not the correct explanation of A

2) b) Both A and R are true but R is not the correct explanation of A