

Board - NCERT

Class - 6th

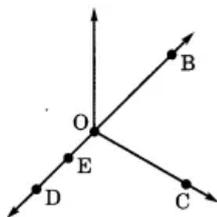
Topic - Basic Geometrical Ideas

Exercise - 4.1

Q1. Use the figure to name:

- (a) Five points
- (b) A line
- (c) Four rays
- (d) Five-line segments

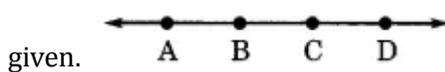
Sol. (a) Five points are: O, B, C, E, and D

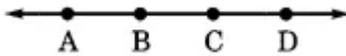


- (b) Name of the line is \overleftrightarrow{DB} or \overleftrightarrow{BD} .
- (c) Four rays are: \vec{OC} , \vec{OB} , \vec{OE} or \vec{OD}
- (d) Five-line segments are:

\overline{OE} , \overline{ED} , \overline{OD} , \overline{OB} and \overline{EB}

Q2. Name the line given in all possible (twelve) ways, choosing only two letters at a time from the four

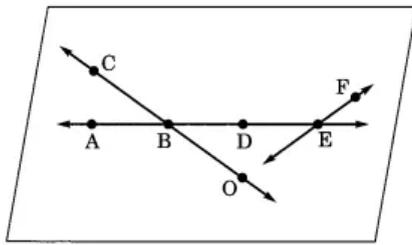


Sol.  The given line can be named as follows:

- (i) \overleftrightarrow{AB}
- (ii) \overleftrightarrow{AC}
- (iii) \overleftrightarrow{AD}
- (iv) \overleftrightarrow{BC}
- (v) \overleftrightarrow{BD}
- (vi) \overleftrightarrow{CD}
- (vii) \overleftrightarrow{BA}
- (viii) \overleftrightarrow{CA}
- (ix) \overleftrightarrow{DA}
- (x) \vec{CB}
- (xi) \vec{DB}
- (xii) \vec{DC}

Q3. Use the figure to name:

- (a) Line containing point E.
- (b) Line passing through A.
- (c) Line on which 0 lies.
- (d) Two pairs of intersecting lines.



sol.

- (a) \overleftrightarrow{EF}
- (b) \overleftrightarrow{AE}
- (c) \overleftrightarrow{BC} or \overleftrightarrow{BO}
- (d) \overleftrightarrow{CO} or \overleftrightarrow{AE} or \overleftrightarrow{AE} or \overleftrightarrow{EF}

Q3. How many lines can pass through

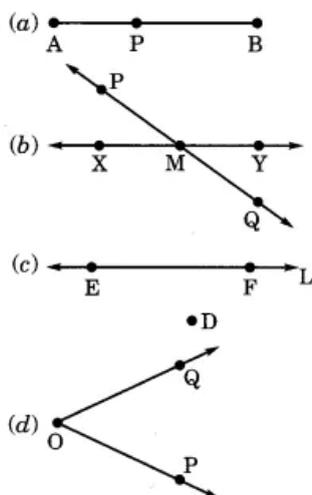
- (a) one given point?
- (b) two given points?

Sol. (a) Infinite. Many lines can pass through a given point.
 (b) Only one line can pass through two given points.

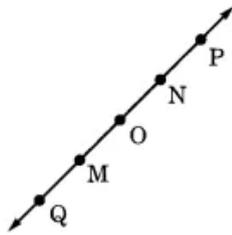
Q4. Draw a rough figure and label suitably in each of the following cases:

- (a) Point P lies on \overline{AB}
- (b) \overleftrightarrow{XY} and \overleftrightarrow{PQ} intersect at M.
- (c) Line L contains E and F but not D.
- (D) \overleftrightarrow{OP} and \overleftrightarrow{OQ} meet at O

Sol.



Q5. Consider the following figure of line MN. Say whether the following statements are true or false in the context of the given figure.



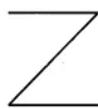
- (a) Q, M, O, N, P are points on the line \overleftrightarrow{MN} .
- (b) M, O, N are points on a line segment MN.
- (c) M and N are endpoints of line segment MN
- (d) O and N are endpoints of line segment OP
- (e) M is one of the endpoints of line segment QO
- (f) M is a point on ray OP.
- (g) Ray \overrightarrow{OP} is different from ray \overrightarrow{QP}
- (h) Ray \overrightarrow{OP} is different from ray \overrightarrow{OM} .
- (i) Ray \overrightarrow{OM} is not opposite to ray \overrightarrow{OP} .
- (j) O is not an initial point of \overrightarrow{OP} .
- (k) N is the initial point of NP and NM.

sol. (a) True

- (b) True
- (c) True
- (d) False
- (e) False
- (f) False
- (g) True
- (h) False
- (i) False
- (j) False
- (k) True

Exercise – 4.2

Q1. Classify the following curves as (i) open or (ii) closed.



(a)



(b)



(c)



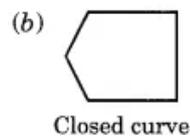
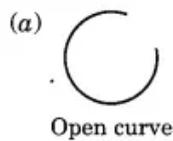
(d)

- Sol. (a) Open curve
(b) Closed curve
(c) Open curve
(d) Closed curve

Q2. Draw rough diagrams to illustrate the following:

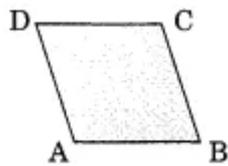
- (a) Open curve
(b) Closed curve

Sol.



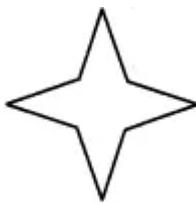
Q3. Draw any polygon and shade

Sol. ABCD is the required polygon whose interior region is shaded.



Q4. Consider the given figure and answer the questions.

- (a) Is it a curve?
(b) Is it closed?

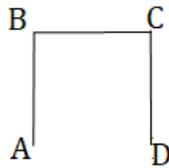
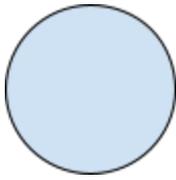


- Sol. (a) Yes, it is a curve.
(b) Yes, it is a closed curve.

Q5. 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.

Sol. (a) The required closed curve is a circle.

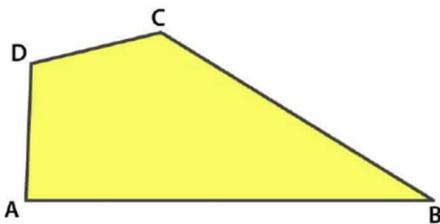


(b) ABCD is the required open curve.

(c) A polygon with two sides is not possible.

Exercise – 4.3

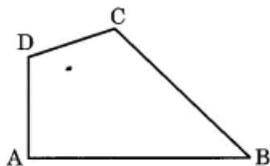
Q1. Name the angles in the given figure.



Sol. The angles are:

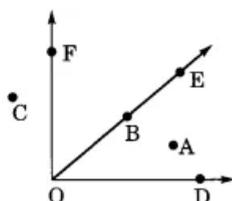
- (i) $\angle A$ or $\angle DAB$
- (ii) $\angle B$ or $\angle CBA$
- (iii) $\angle C$ or $\angle DCB$
- (iv) $\angle D$ or $\angle ADC$.

Q2. In the given diagram, name the point(s):



- (a) In the interior of $\angle DOE$
- (b) In the exterior of $\angle EOF$
- (c) On $\angle EOF$

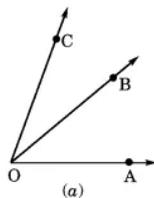
Sol. (a) A is the point in the interior $\angle DOE$.
 (b) C is the point on the exterior $\angle EOF$.
 (c) B is the point on $\angle EOF$.



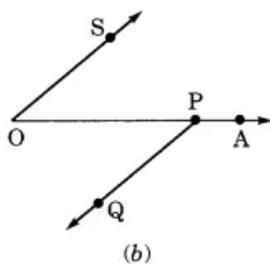
3. Draw rough diagrams of two angles such that they have

- (a) One point in common
- (b) Two points in common
- (c) Three points in common
- (d) Four points in common
- (e) One ray in common

Solution - (a)

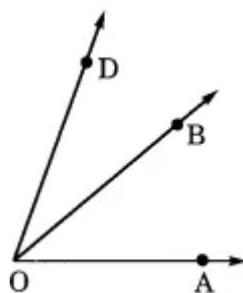


(b) In figure (b), O and P are the common points in $\angle SOA$ and $\angle OPQ$.



(c) Such a diagram is not possible.

(d) Such a diagram is not possible.

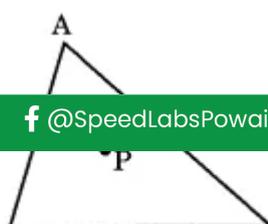


(e) \vec{OB} is the common ray of $\angle AOB$ and $\angle DOB$.

Exercise - 4.4

Q1. Draw a rough sketch of a triangle ABC. Mark a point P in its interior and a point Q in its exterior. Is the point A in its exterior or on its interior?

Sol. Triangle ABC is the given triangle.



P is in the interior of $\triangle ABC$.

Q is on the exterior of $\triangle ABC$.

A is neither in the exterior nor in the interior. It is on the triangle ABC.

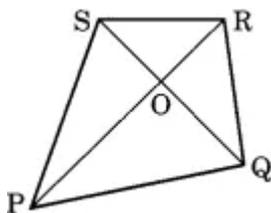
- Q2. (a) Identify three triangles in the figure.
(b) Write the names of seven angles.
(c) Write the names of six line segments.
(d) Which two triangles have $\angle B$ in common?

- Sol. (a) Three triangles are: $\triangle ABC$, $\triangle ABD$, and $\triangle ADC$.
(b)
(i) $\angle ABC$
(ii) $\angle ADB$
(iii) $\angle BAD$
(iv) $\angle ADC$
(v) $\angle ACD$
(vi) $\angle DAC$
(vii) $\angle BAC$.
(c) \overline{AB} , \overline{BD} , \overline{AD} , \overline{DC} , \overline{BC}
(d) $\triangle ABC$ and $\triangle ABD$ have $\angle B$ as common.

Exercise – 4.5

- Q1. Draw a rough sketch of a quadrilateral PQRS. Draw its diagonals. Name them. Is the meeting point of the diagonals in the interior or exterior of the quadrilateral?

Sol.



- (i) We have a quadrilateral PQRS.
(ii) PR and QS are its two diagonals.
(iii) O is the meeting point of the diagonals PR and QS which is in the interior of the quadrilateral.

Q2. Draw a rough sketch of a quadrilateral KLMN. State:

- (a) two pairs of opposite sides
- (b) two pairs of opposite angles
- (c) two pairs of adjacent sides
- (d) two pairs of adjacent angles.

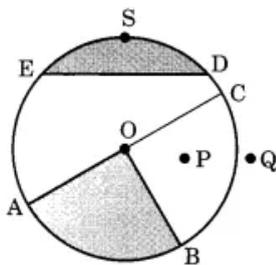
Sol. KLMN is the given quadrilateral.

- (a) \overline{KL} , \overline{NM} and \overline{KN} , \overline{LM} are the pairs of opposite sides.
- (b) $\angle K$ and $\angle M$, $\angle L$ and $\angle N$ are the pairs of opposite angles.
- (c) \overline{KL} , \overline{KN} and \overline{NM} , \overline{ML} are the pairs of adjacent sides.
- (d) $\angle K$ and $\angle L$, $\angle N$, and $\angle M$ are the pairs of adjacent angles.

Exercise – 4.6

Q1. From the figure, identify:

- (a) the center of the circle
- (b) three radii
- (c) a diameter
- (d) a chord
- (e) two points in the interior
- (f) a point in the exterior
- (g) a sector
- (h) a segment.



Sol. In the given figure,

- (a) O is the center of the circle.
- (b) Three radii of the given circle are \overline{OA} , \overline{OB} and \overline{OC}
- (c) \overline{AC} is the diameter of the circle.
- (d) \overline{ED} is a chord of the circle.
- (e) O and P are in the interior of the circle.
- (f) Q is a point in the exterior of the circle.

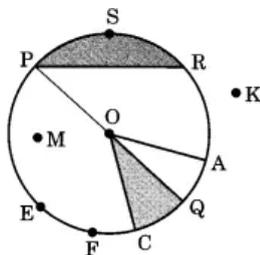
- (g) OBA is a sector of the circle.
(h) EDSE, the shaded region is a segment of the circle.

- Q2. (a) Is every diameter of a circle also a chord?
(b) Is every chord of a circle also a diameter?

- Sol. (a) Yes, every diameter is the longest chord of a circle.
(b) No, every chord is not a diameter of a circle.

- Q3. Draw any circle and mark
(a) its centre
(b) a radius
(c) a diameter
(d) a sector
(e) a segment
(f) a point in its interior
(g) a point in its exterior
(h) an arc.

- Sol. In the given circle,



- (a) O is the center.
(b) \overline{OA} is a radius.
(c) \overline{PQ} is a diameter.
(d) OQC is a sector (shaded part)
(e) PSR (shaded part) is the segment.
(f) M is in the interior of the circle.
(g) K is in the exterior of the circle.
(h) \overline{EF} is an arc of the circle.

- Q4. Say 'true' or 'false'.
(a) Two diameters of a circle will necessarily intersect.
(b) The center of a circle is always in its interior.

- Sol. (a) True

(b) True