MATHS

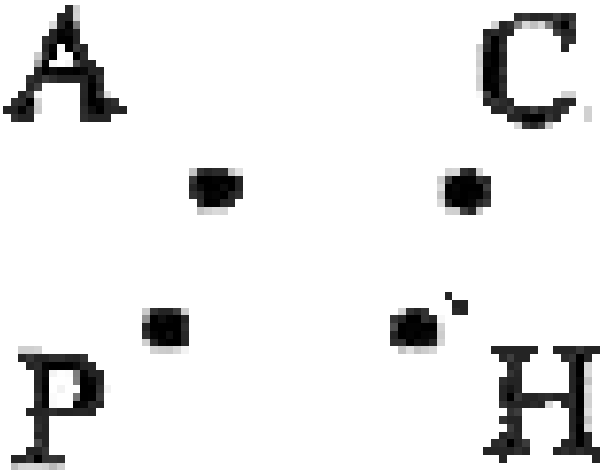
BOOKS - NAND LAL PUBLICATION

BASIC GEOMETRICAL IDEAS

Solution Of Textual Questions

1. With a sharp tip of pencil mark four points on a paper and name them by the letters A, C, Pand H. Try to name these points in different

ways. One such way could be this:



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2. A star in the sky also gives an idea of a point. Identify at least five such situtations in our daily life

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Try These

1. Try to find more examples for line segments from you surroundings.

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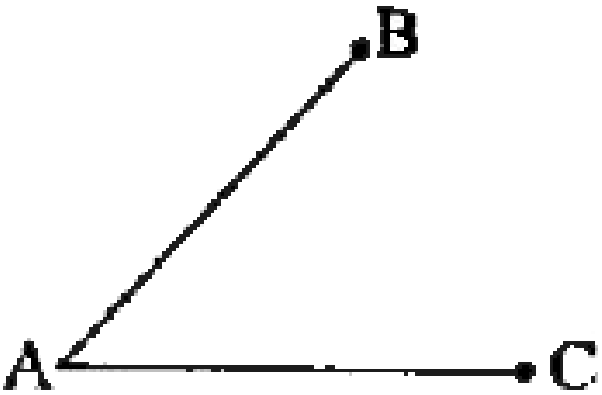
2. Name the line segments in fig. 4.2. Is A, the end point of each line segment?



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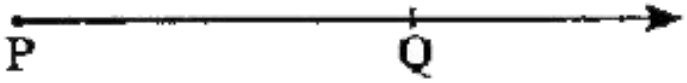
3. If $\overrightarrow{PQ}$ is a ray.

(a) What is its starting point?

(b) Where does the point Q lie on the ray?

(c) Can we say that Q is the starting point of

this ray?



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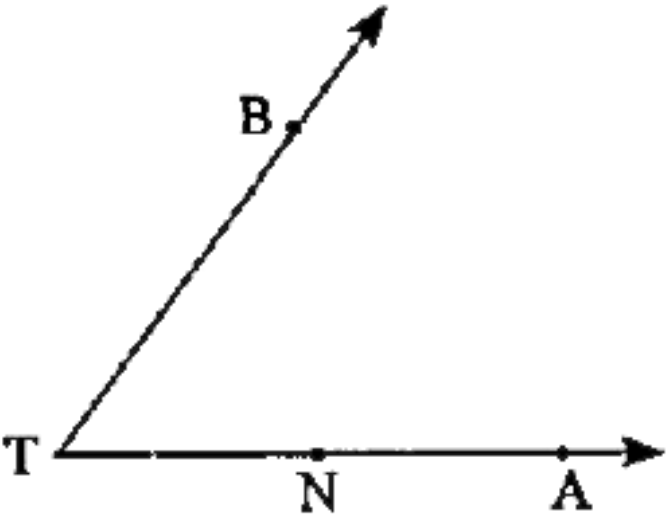
4. Name the rays given in this picture.

Is T a starting point of each of these rays?



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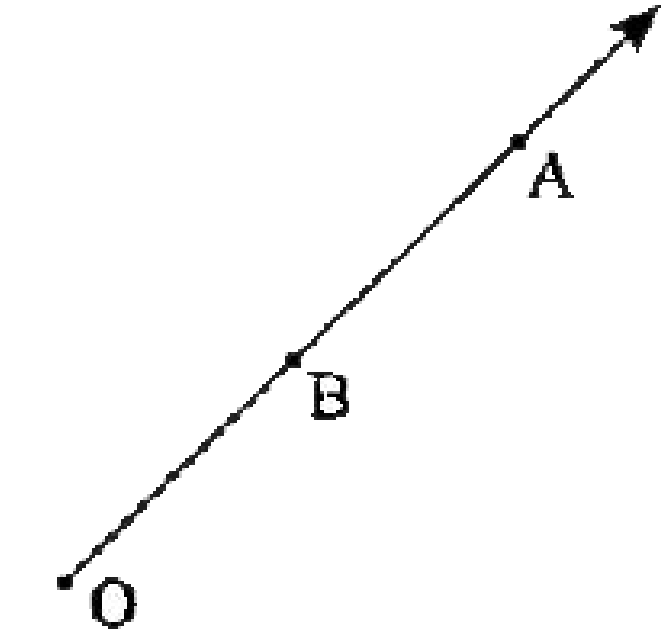
5. Here is a ray $\overrightarrow{OA}$. It starts at O and passes through the point A. It also passes through the point B. Can you also name it as $\overrightarrow{OB}$? Why? $\overrightarrow{OA}$ and $\overrightarrow{OB}$ are same here.

Can we write $\overrightarrow{OA}$ as $\overrightarrow{AO}$? Why or why not? Draw five rays and write appropriate names for them. , What do the arrows on each of these

rays show?



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Do This

1. Take a sheet of paper. Make two folds (and crease them).to represent intersecting lines and discuss.

Can two lines intersect in more than one point?

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2. Take a sheet of paper. Make two folds (and crease them).to represent intersecting lines and discuss.

Can more than two lines intersect in one point?

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3. Try to form a polygon with

(1)Five matchsticks, (2) Four matchsticks, (3) Three matchsticks , (4) Two matchsticks

In which case was it is not possible?

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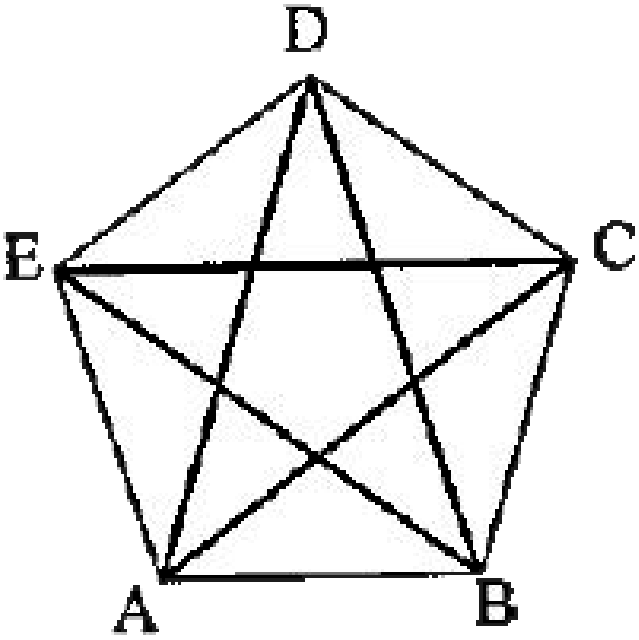

4.

In the figure $\overline{AC}$, $\overline{AD}$, $\overline{BD}$, $\overline{BE}$ and (CE) are diagonals. Is $\overline{BC}$ a diagonal. Why or why not? If you try to join adjacent vertices, will the result be a diagonal? Name all the sides, adjacent vertices of the figure ABCDE.

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5. Draw an octagon ABCDEFGH and name all the sides, adjacent sides and vertices as well as the diagonals of the polygon.

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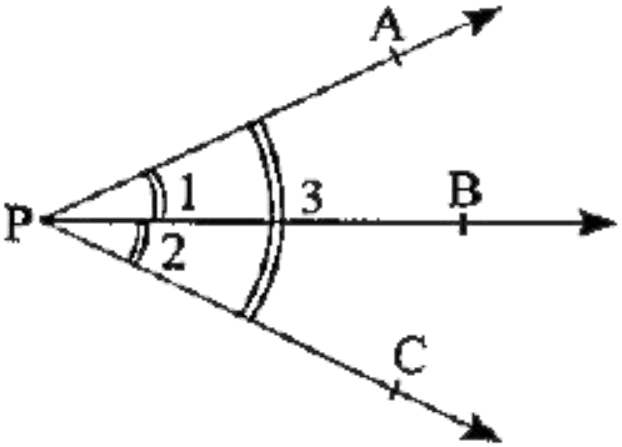
Think Discuss And Write

1. Look at the fig. (4.18). What is the name of the angle? Shall we say $\angle P$? But then which

one do you mean? By $\angle P$ what do we mean?



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Exercise 4 1

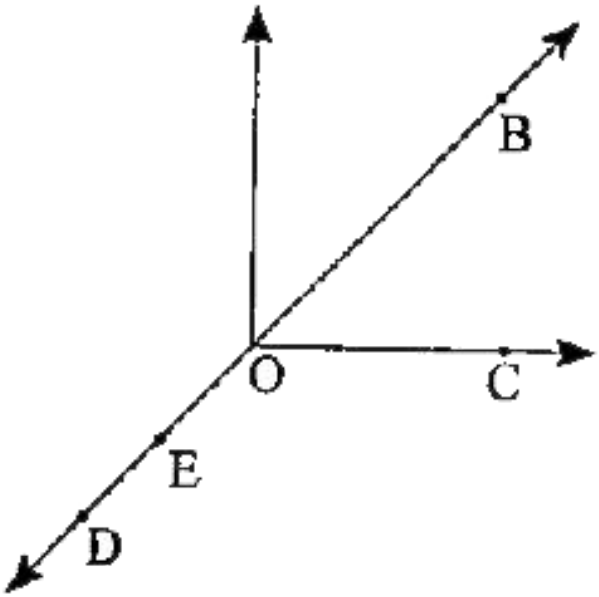
1. Use the figure to name

(a) Five points

(b) A line

(c) Four rays

(d) Five line segments.



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

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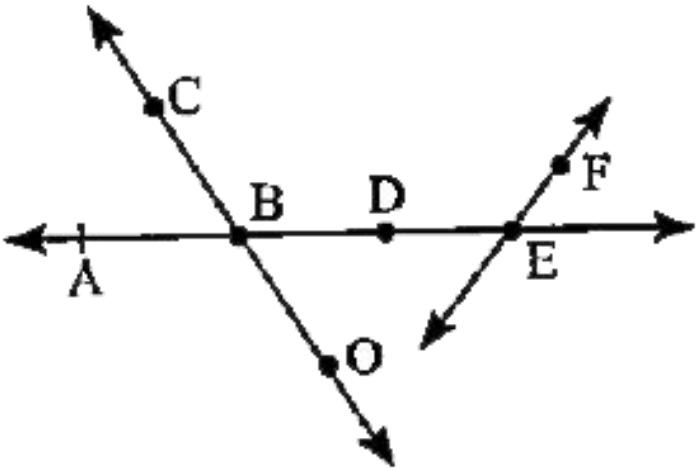
3. Use the figure to name,



(a) Line containing point E.

(b) Line passing through A.

(c) Line on which O lies

(d) Two pairs of intersecting lines

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4. How many lines can pass through?

A given point?

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5. How many lines can pass through

two given points?

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

Point P lies On $\overline{A}B$.

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

XY and PQ intersect at M.

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

Line l contains A and B but not C.

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

$\overrightarrow{OP}$ and $\overrightarrow{OQ}$ meet at O.

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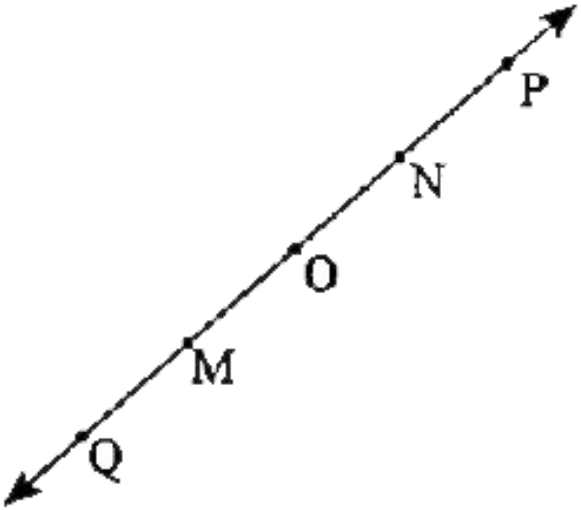
10. Consider the following figure of line $\overrightarrow{MN}$.

Say whether following statements are true or false in context of the given figure.



Q, M, O, N, P are points on line

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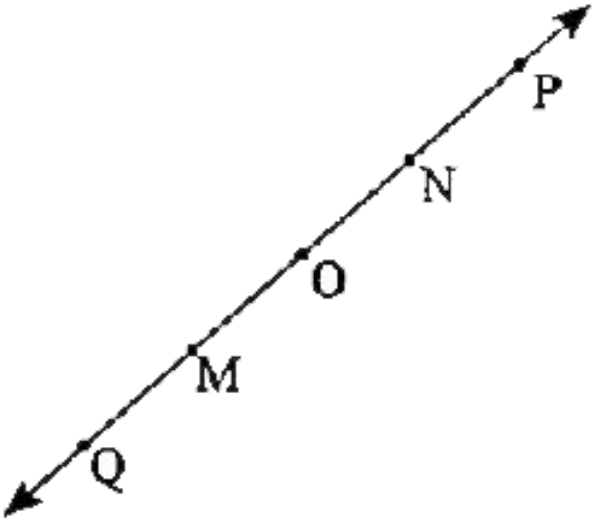
11. Consider the following figure of line $\overrightarrow{MN}$.

Say whether following statements are true or false in context of the given figure.



M, O, N are points on the line segment $\overrightarrow{MN}$

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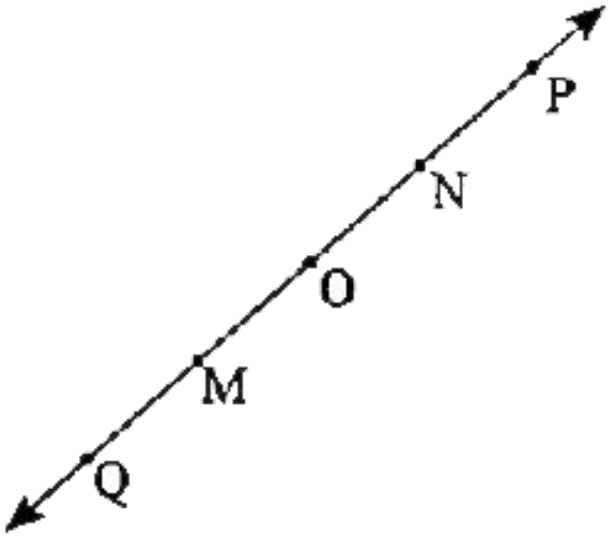
12. Consider the following figure of line $\overrightarrow{MN}$.

Say whether following statements are true or false in context of the given figure.



M and N are the end points of line segment $\overrightarrow{MN}$.

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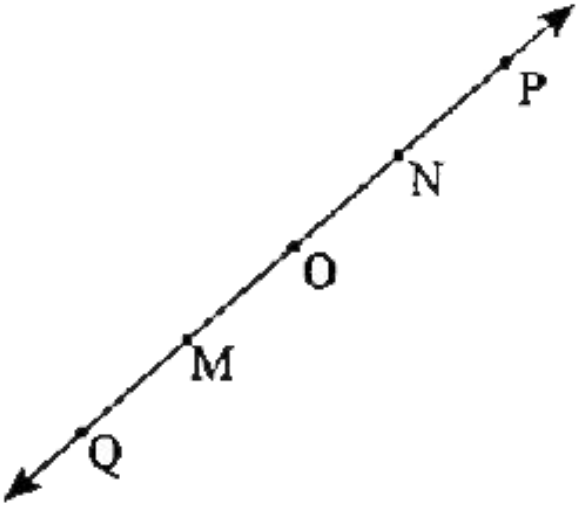
13. Consider the following figure of line $\overrightarrow{MN}$.

Say whether following statements are true or false in context of the given figure.



O and N are the end points of the line segment $\overrightarrow{OP}$.

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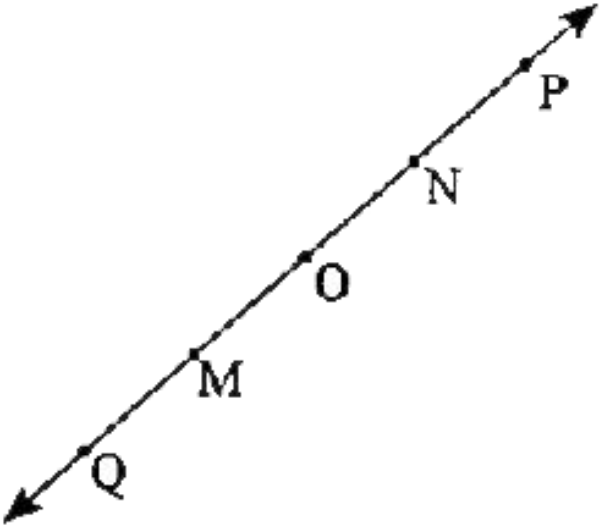
14. Consider the following figure of line $\overrightarrow{MN}$.

Say whether following statements are true or false in context of the given figure.



M is one of the end points of the line segment $\overrightarrow{QO}$

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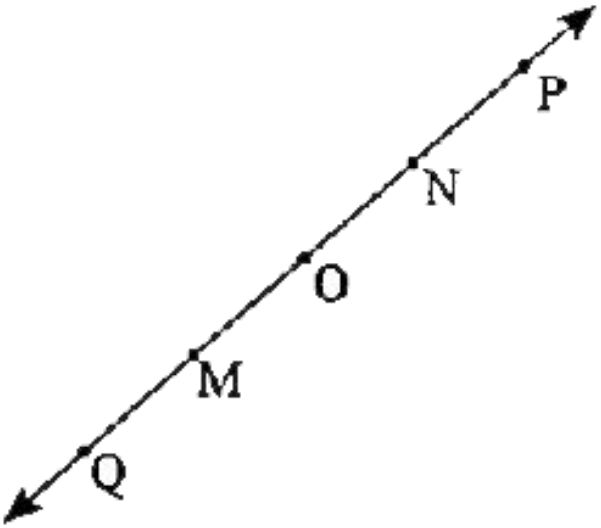
15. Consider the following figure of line $\overleftrightarrow{MN}$.

Say whether following statements are true or false in context of the given figure.



M is the point on the ray $\overrightarrow{OP}$

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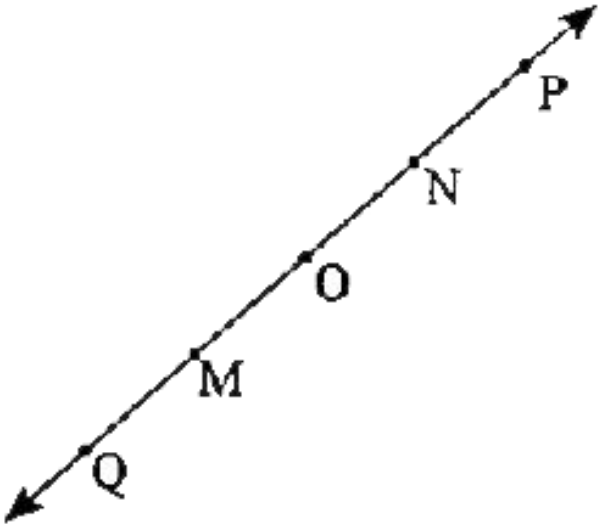
16. Consider the following figure of line $\overrightarrow{MN}$.

Say whether following statements are true or false in context of the given figure.



Ray OP is different from ray $\overrightarrow{QP}$

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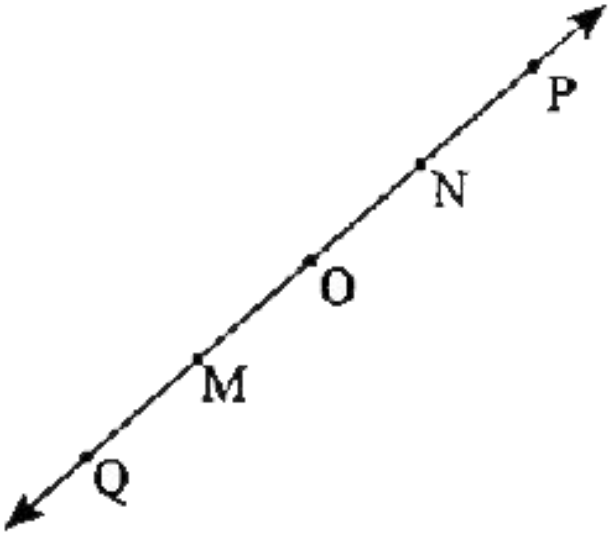
17. Consider the following figure of line $\overrightarrow{MN}$.

Say whether following statements are true or false in context of the given figure.



Ray OP is same as ray $\overrightarrow{OM}$

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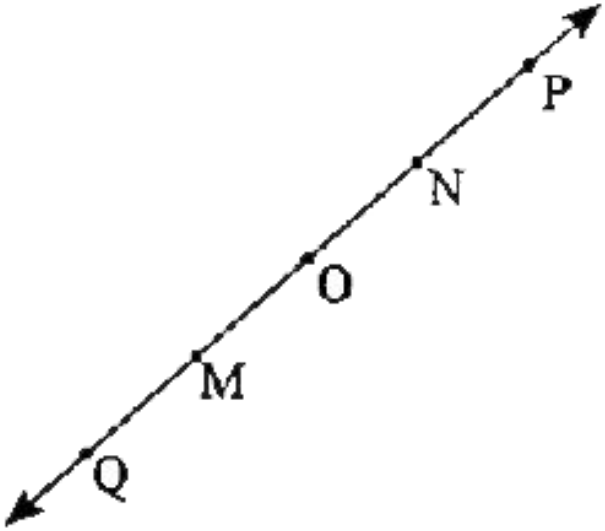
18. Consider the following figure of line $\overleftrightarrow{MN}$.

Say whether following statements are true or false in context of the given figure.



Ray OM is not opposite ray $\overrightarrow{OP}$

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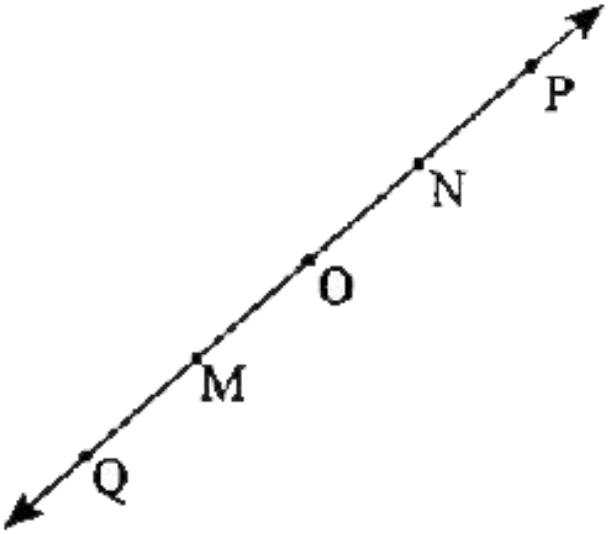
19. Consider the following figure of line $\overrightarrow{MN}$.

Say whether following statements are true or false in context of the given figure.



O is not the initial point of $\overrightarrow{OP}$

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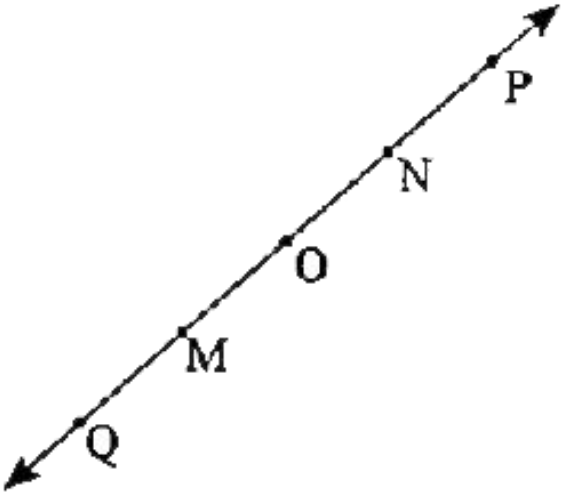
20. Consider the following figure of line $\overrightarrow{MN}$.

Say whether following statements are true or false in context of the given figure.



N is the initial point of $\overrightarrow{NP}$ and $\overrightarrow{NM}$

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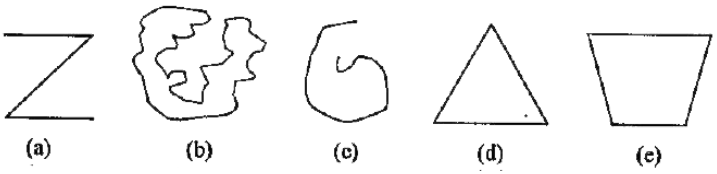
Exercise 4 2

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



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2. Draw a rough diagrams to illustrate the following:

Open Curve

Closed Curve.

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3. Draw a rough diagrams to illustrate the following:

Open Curve

Closed Curve.

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4. Draw any polygon with three sides and shade its interior.

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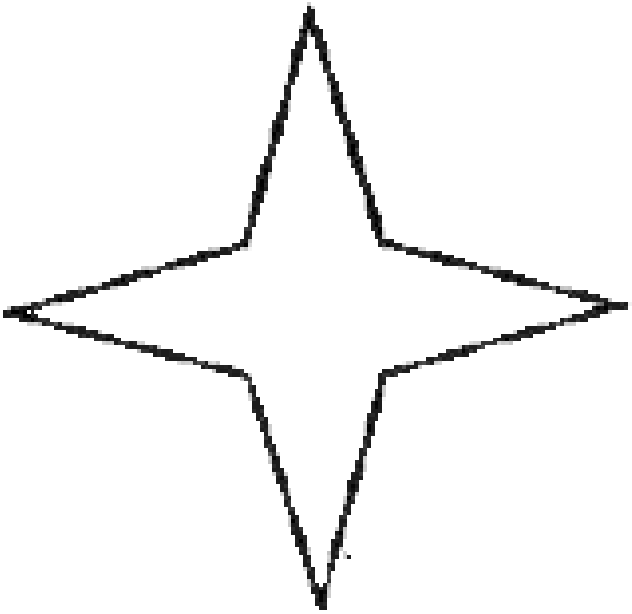
5. Consider the given figure and answer the questions.



(a) Is it a curve?

(b) Is it closed?

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6. Illustrate, if possible, each one of the following with a rough diagram,

A closed curve that is not a polygon.

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7. Illustrate, if possible, each one of the following with a rough diagram,

An open curve made up entirely of line segment.

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8. Illusustrate,if possible,each one of the following with a rough diagram:

A polygon with two sides.

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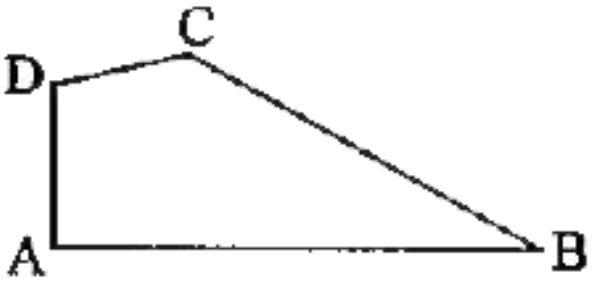
Exercise 4 3

1. Name the angles in the given figure.



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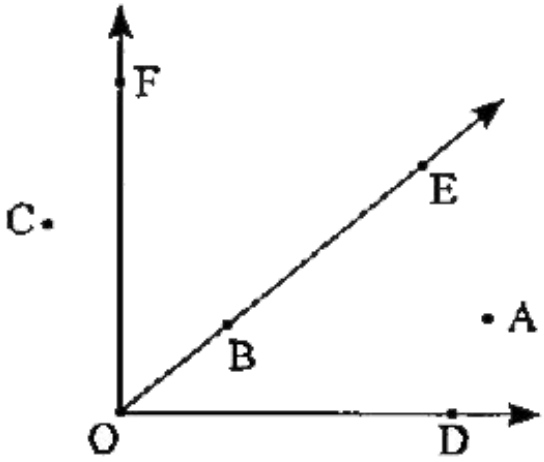
2. In the given figure, name the point(s).



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3. Draw rough digarams of two angles such that they have :

One point in common

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4. Draw rough digarams of two angles such that they have :

Two points in common

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5. Draw rough digarams of two angles such that they have :

Three points in common

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6. Draw rough digarams of two angles such that they have :

Four points in common

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7. Draw rough digarams of two angles such that they have :

One ray in common.

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Exercise 4 4

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

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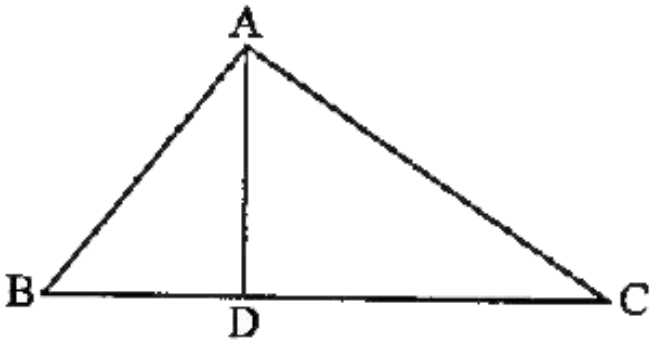
2. Identity the three triangles in the figure.



(b) Write the names of seven angles.

(c) Write the names of six line segments.

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Exercise 4 5

1. Draw a rough sketch of a quadrilateral PQRS .Draw its diagonals.

Name them.Is the meeting point of the diagonal in the interior or exterior of the quadrilateral?

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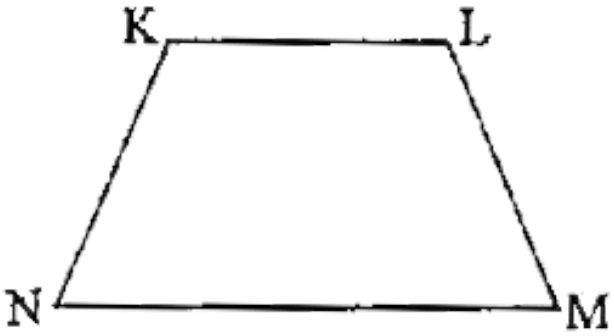
2. Draw a rough sketch of the quadrilateral KLMN. State



(a) Two pairs of opposite sides.

(b) Two pairs of opposite angles.

(c) Two pairs of adjacent sides.

(d) Two pairs of adjacent angles.

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3. Investigate:

Use strips nad fasteners to make a triangle

and a quadrilateral.

Try to push inward at any one vertex of the triangle.Do the same to the quadrilateral.

Is the triangle distorted ?Is the quadrilateral distorted?Is the triangle rigid?

Why is it that structures like electric towers make use of triangular shapes and not quadrilaterals?

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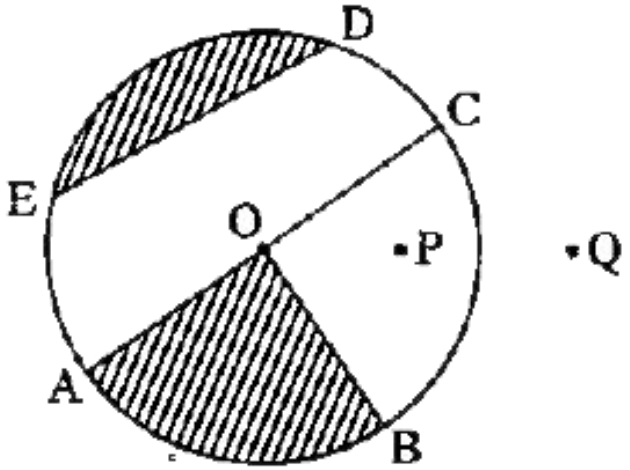
Exercise 4 6

1. From the figure, Identify :



(a) The centre of 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

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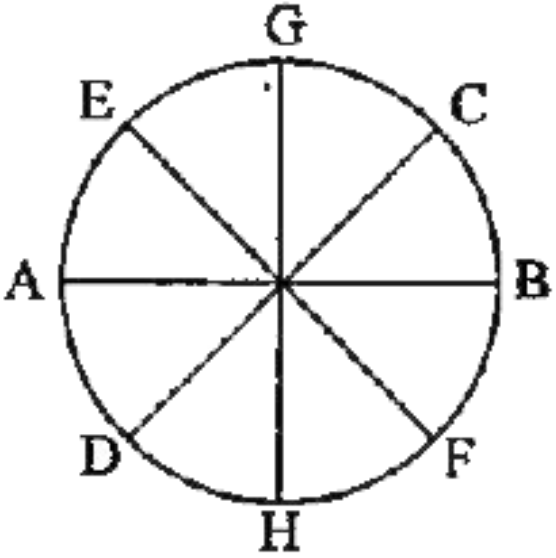
2. Is every diameter of a cirlce also a chord?



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3. Is every chord of a circle also a diameter?

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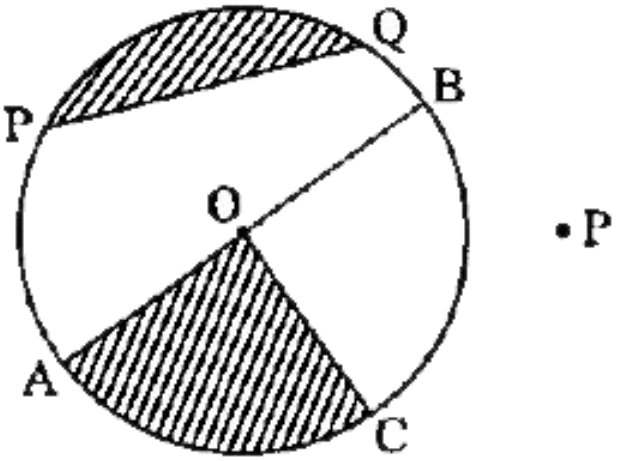
4. Draw any circle and mark.



(a) Its centre

(b) A radius

(c) A diameter.

(d) A sector

(e) A segment

(f) A point in its interior

(g) a point of its exterior

(h) An arc

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5. Say True or False.

Two diameters of a circle will necessarily intersect.

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6. Say True or False.

Centre of the circle is always in its interior.

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Additional Questions For Practice Very Short Answer Type Questions

1. Number of common points two parallel lines have

A. 0

B. 1

C. infinite

D. none of these

Answer: A

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2. A line contains

A. finite points

B. infinite points

C. two points

D. none of these

Answer: B

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3. A ray has

A. two end points

B. No end points

C. one end point

D. none of these

Answer: C

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4. Two planes intersect

A. in a line

B. at a point

C. in a plane

D. none of these

Answer: A

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5. A figure formed by two rays with same initial point is known as

A. a ray

B. a line

C. an angle

D. none of these

Answer: C

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6. The vertex of an angle lies

A. in its interior

B. in its exterior

C. on the angle

D. none of these

Answer: C

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7. By joining any two points on the circle we obtain its:

A. radius

B. diameter

C. chord

D. none of these

Answer: C

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8. Total number of the diameters of the circle are

A. 1

B. 2

C. uncountable

D. none of these

Answer: C

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9. A circle of radius r cm has a diameter of length

A. r cm

B. 2r cm

C. $\frac{r}{2}$ cm

D. none of these

Answer: B

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10. A circle of radius r cm has a diameter of length

A. fixed length

B. infinite length

C. 0 length

D. none of these

Answer: A

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11. Fill in the blanks:

Every point on a cirlce is_____ from the centre.

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12. Table top give us the idea of ____

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13. Five points are _____ if they all line on a line.

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14. Point is a mark of _____

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15. The plus sign represent _____ line segments.

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16. In $\triangle ABC$ vertex opposite to side BC is _____-

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17. A diagonal of a polygon joins two _____ vertices.

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18. A simple closed curve never _____ itself.

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19. A quadrilateral has _____ diagonals.

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20. Corner of a triangle represents a _____

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21. State whether the following statements are true or false.

All vertices of a triangle are adjacent.

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22. State whether the following statements are true or false

Quadrilateral has four pairs of opposite sides.

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23. State whether the following statements are true or false.

Diameter of a circle is twice its chords.

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24. State whether the following statements are true or false.

Triangle has no diagonals

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25. State whether the following statements are true or false.

Ray AB is same as ray BA

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26. State whether the following statements are true or false

Two lines in a plane always intersect at point.

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27. In each of the following state if the statement is true or false:

Any two radii of a circle make up diameter.

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28. In each of the following state if the statement is true or false:

Every circle has a centre.

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29. State whether the following statements are true or false

Circle can have many radii and diameters.

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30. State whether the following statements are true or false.

In $\triangle PQR$ side opposite to $\angle Q$ is PR.

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Additional Questions For Practice Short Answer Type Questions

1. P, Q, R are three points in a plane. Join them in pairs. How many lines will you get if-

(a) P, Q and R are not collinear.

(b) P, Q and R are collinear.

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2. Illustrate the following with a rough diagram.

A closed curve which is a polygon.

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3. Illustrate the following with a rough diagram.

A closed curve which is not a polygon.

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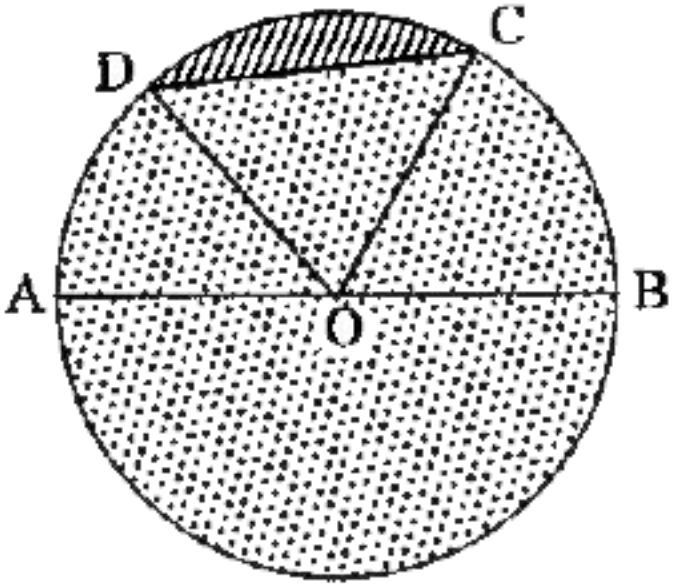
4. O is the centre of the circle.



(a) Name all the chords of the circle.

(b) Name all the radii of the circle.

(c) Name the chord which is not the diameter of the circle.

(d) Identify three sectors of the circle.

(e) Which is the smaller and larger segment of the circle.

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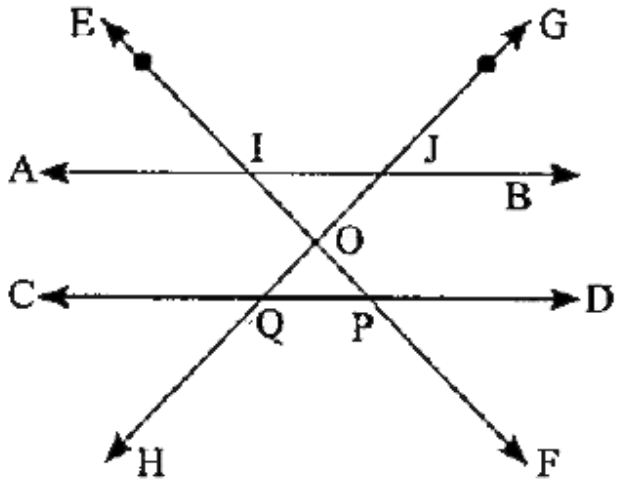
Additional Questions For Practice Long Answer Type Questions

1. From the adjoining fig answer the following:



(a) What is the number of parallel lines

(b) Number of pairs of intersecting lines

(c) Three sets of collinear points

(d) Three sets of points of intersection of two lines

(e) Number of triangles formed

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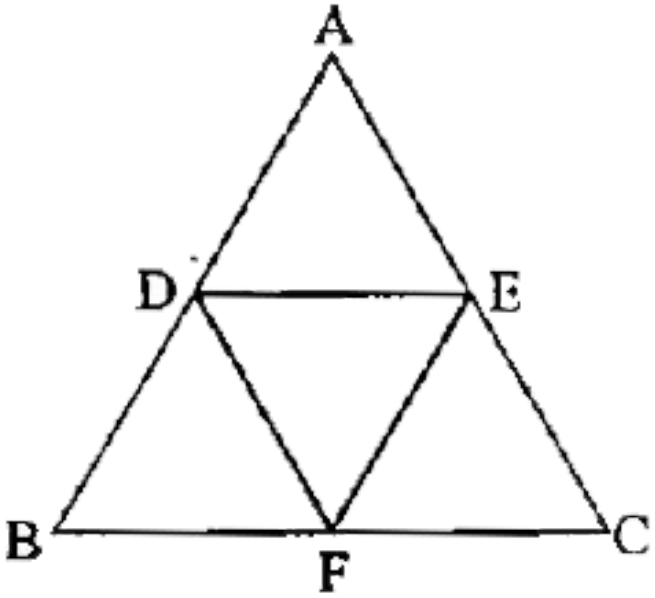
2. Use the figure to name:



(a) 5 triangles

(b) 5 quadrilaterals

(c) 5 angles formed

(d) Which two triangles have $\angle B$ in common ?

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3. Draw the quadrilaterals ABCD and write all pairs of (a) adjacent sides (b) adjacent angles (c) opposite sides (d) opposite angles (e) two diagonals

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Additional Questions For Practice Hots High Order Thinking Skills

1. With O as centre and any convinient radius draw circle. How will you draw two chords such that joining the end paints of these chords in sequence we get (i) A square (ii) A rectangle

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Sample Paper For Practice

1. If lines l and m intersect at a point Also m and n intersect at a point, is it necessary that lines l,m,n intersect at the same point.

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2. If points A, B, C lie on the same line, also points C, D, E lie on the same line, Do the points A, B, C, D, E always lie on the same line?

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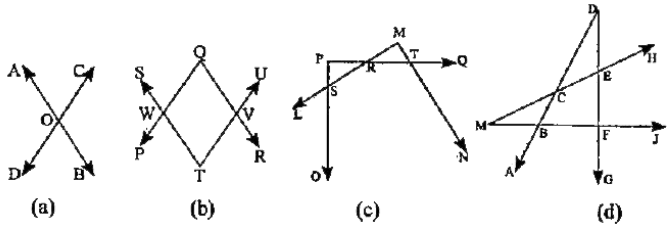
3. Identify the common points in the rough diagram of two angles in the following:



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4. Identify a line, a plane or curved surface from the following :

(a) Side of a rectangle (b) Surface of ruler

(c) Floor of room (d) Surface of football.

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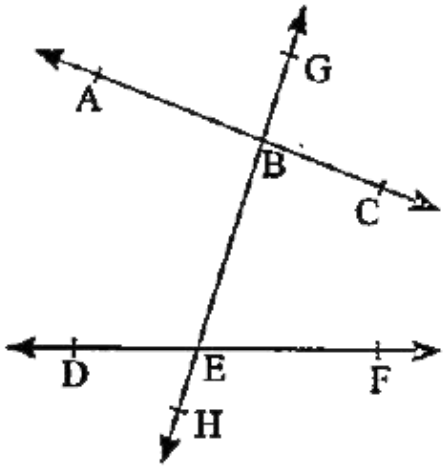
5. Observe the fig. and answer the following:



(a) Name the line passing through point G.

(b) Name the line having 3 collinear points.

(c) How many lines are shown in the figure?

(d) Name all the pairs of intersecting lines.

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6. Draw a circle of radius 3 cm and mark the following on it-

(a) Longest chord of the circle.

(b) Region enclosed between arc and two radii

(c) Length of the boundary of circle

(d) Half of the longest chord

(e) Region enclosed between arc and chord.

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7. Match the following.

(a)	Distance around the edge of circle	–	Segment
(b)	Region bounded by two radii and an arc	–	Point
(c)	Region bounded by a chord and an arc	–	Circumference
(d)	Part of circle enclosed by two points	–	Sector
(e)	Dot gives an idea of	–	Infinite length
(f)	A line has	–	Arc

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8. Answer the following questions:

Draw a semicricle with centre O and radius 2 cm. Is the diameter that determines the semicircle, a part of semi circle? Give reasons.

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9. Given a circle with centre O and radius 2.5 cm, what is the length of the longest chord of the circle?

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10. How many circles can be drawn to pass through two given points?

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11. There is one and only one circle passing through three non-collinear points.

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12. Why it is not possible for a line to have midpoint?

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13. How many lines can be drawn through three non-collinear points?

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14. Which letter of English alphabet form simple closed curve?

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15. How many pairs of adjacent sides are there in a triangle? Name them

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16. Find the difference between the following:

Diameter and a chord

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17. Find the difference between the following:

Sector and a segment

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18. Find the difference between the following:

Arc and a semicircle

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