

Exercise 7.1

Question 1: Define the following terms.

- (i) Line segment
- (ii) Collinear points
- (iii) Parallel lines
- (iv) Intersecting lines
- (v) Concurrent lines
- (vi) Ray
- (vii) Half-line

Solution:

(i) Line segment: The part of a line that connects two points or we can say that a shortest distance between the two points. A line segment is one-dimensional.



Here AB is a line segment.

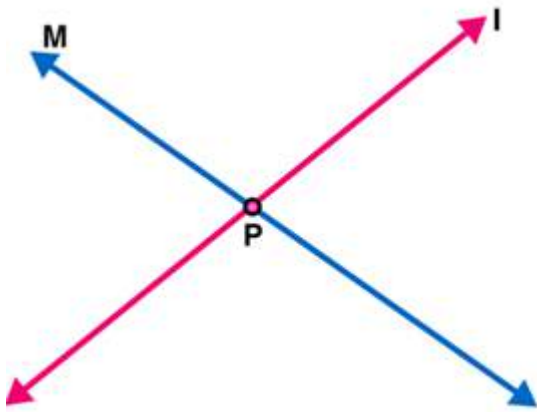
(ii) Collinear points: Two or more points are said to be collinear if all the points lie on same line.

(iii) Parallel lines : Two lines in a plane are said to be parallel lines if they do not intersect each other.



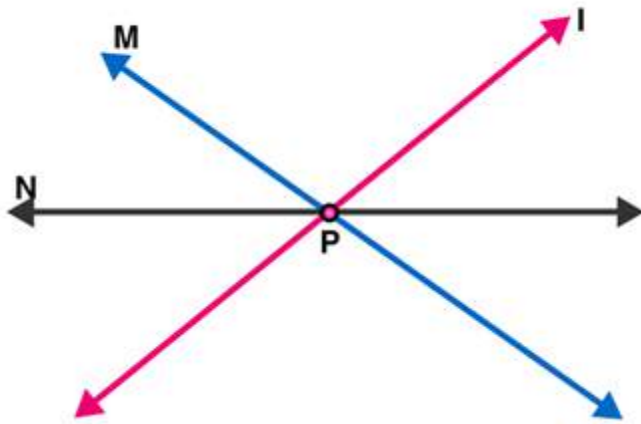
Here l and m are parallel lines.

(iv) Intersecting lines: Two lines are intersecting if they have a common point. The common point is known as point of intersection.



Here I and M are intersecting lines. And P is point of intersection.

(v) Concurrent lines: Two or more lines are said to be concurrent if there is a point which lies on all of them.



Here I, m and n are concurrent lines.

(vi) Ray: A straight line extending from a point indefinitely in one direction only.



Here OA is a ray.

(vii) Half-line: If A, B, C be the points on a line l , such that A lies between B and C, and we delete the point A from line l , the two parts of l that remain are each called a half-line.



Question 2:

- (i) How many lines can pass through a given point?
- (ii) In how many points can two distinct lines at the most intersect?

Solution:

- (i) Infinitely many
- (ii) One

Question 3:

- (i) Given two points P and Q. Find how many line segments do they determine.
- (ii) Name the line segments determined by the three collinear points P, Q and R.

Solution:

- (i) One
- (ii) PQ, QR, PR

Question 4: Write the truth value (T/F) of each of the following statements:

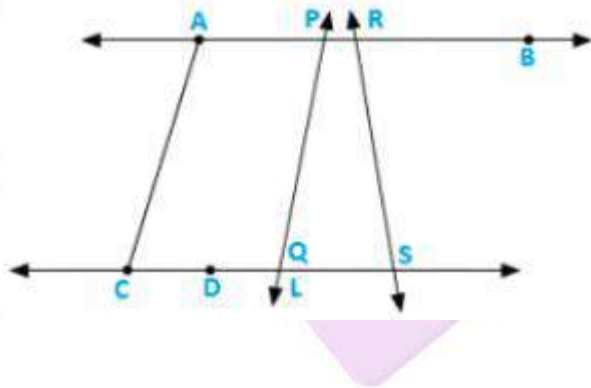
- (i) Two lines intersect in a point.
- (ii) Two lines may intersect in two points.
- (iii) A segment has no length.
- (iv) Two distinct points always determine a line.
- (v) Every ray has a finite length.
- (vi) A ray has one end-point only.
- (vii) A segment has one end-point only.
- (viii) The ray AB is same as ray BA.
- (ix) Only a single line may pass through a given point.
- (x) Two lines are coincident if they have only one point in common

Solution:

- (i) False
- (ii) False
- (iii) False
- (iv) True
- (v) False
- (vi) True
- (vii) False
- (viii) False
- (ix) False
- (x) False

Question 5: In the below figure, name the following:

- (i) Five line segments
- (ii) Five rays
- (iii) Four collinear points
- (iv) Two pairs of non-intersecting line segments



Solution:

(i) Five line segments AB, CD, AC, PQ, DS

(ii) Five rays :

\vec{PA} , \vec{RB} , \vec{DC} , \vec{QS} , \vec{DS}

(iii) Four collinear points. C, D, Q, S

(iv) Two pairs of non-intersecting line segments AB and CD, PB and LS.

Question 6: Fill in the blanks so as to make the following statements true:

- (i) Two distinct points in a plane determine a _____ line.
- (ii) Two distinct _____ in a plane cannot have more than one point in common.
- (iii) Given a line and a point, not on the line, there is one and only _____ line which passes through the given point and is _____ to the given line.
- (iv) A line separates a plane into _____ parts namely the _____ and the _____ itself.

Solution:

- (i) unique
- (ii) lines
- (iii) perpendicular, perpendicular
- (iv) three, two half planes, line.