Solutions for Class 9 Maths Chapter 7 Introduction to Euclid's Geometry

Exercise 7.1

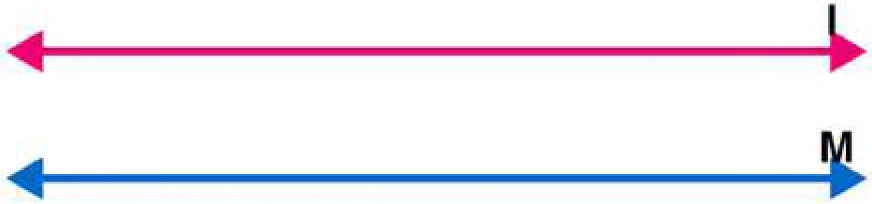
Question 1: Define the following terms.

(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.

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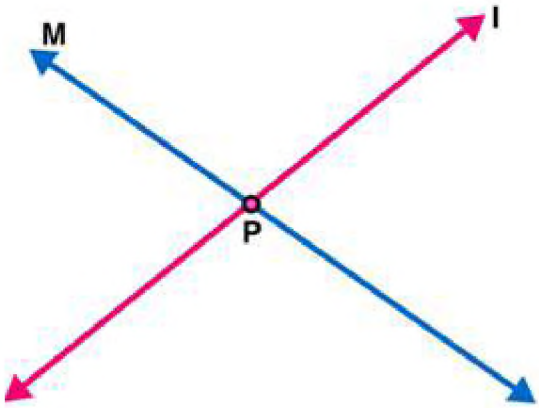
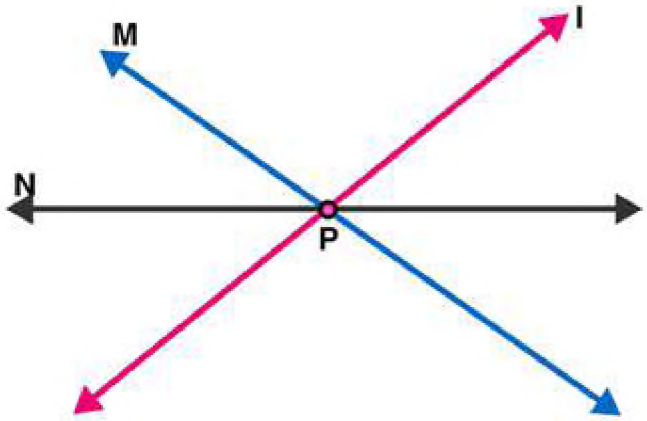


Here l and M are intersecting lines. And P is point of intersection.

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



Here l, 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.

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(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

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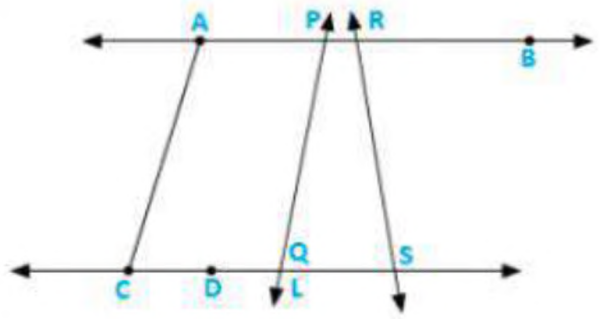
Solution:

(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 :
$\overrightarrow{PA}$, $\overrightarrow{RB}$, $\overrightarrow{DC}$, $\overrightarrow{QS}$, $\overrightarrow{DS}$

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

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

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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.