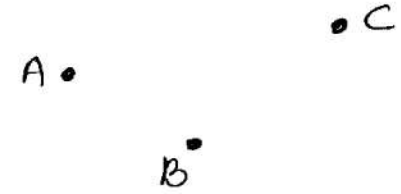
Chapter - 10

Basic Geometrical Concepts

Exercise 10.1

Q.1 Mark three points in your notebook and name them.

Solution



Q.2 Draw a line in your notebook and name it using a small letter of the alphabet.

Solution:



Q3 Draw a line in your notebook and name it by taking any two points on it.

Sol.



Q.4 Give three examples from your environment of

(i) Points (ii) Portion of a line (iii) Plane surfaces

(iv) Portion of a plane (v) curved surfaces

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Solution: (i) Three Example of Points are
(a) tip of alpin
(b) Meeting point of the edges of Surface
(ii) Period at the end of sentence.

(ii) Portion of line: Three examples are.

(a) Thin curtain rods
(b) laser beams
(c) Thread without sluck.

(iii) Plane Surfaces: Three examples are

(a) Surface of table
(b) floor of room
(c) Surface of white board

(iv) Portion of a Plane: Three examples are.

(a) Surface of mirror
(b) Calm water in a Swimming pool
(c) Surface of sheet of the paper

(v) Curved Surfaces: Three examples are

(a) Tube light
(b) Gas cylinder
(c) Joker's cap or oil funnel

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Q.5 : There are a number of ways by which we can visualise a portion of a line. State whether the following represent a portion of a line or not.

(i) A piece of elastic stretched to the breaking point.

(ii) Wire between two electric poles.

(iii) The line thread by which a spider lowers itself.

Solution (i) yes

(ii) No

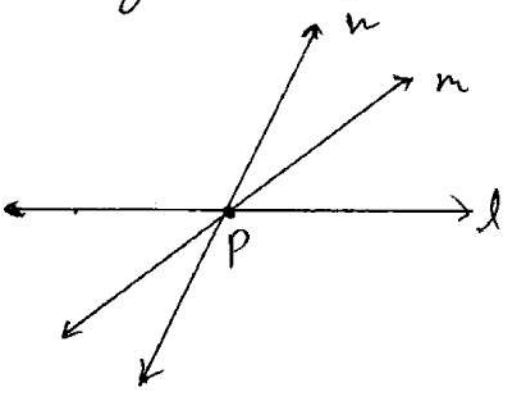
(iii) yes.

Q.6 Can you draw a line on the surface of a sphere which lies wholly on it.

Solution : No, such lines are not possible.

Q.7 Mark a point on a sheet of paper and draw a line passing through it. How many lines can you draw through this point.?

Sol: Let P, be a point on a plane, There can infinite lines pass through this point.

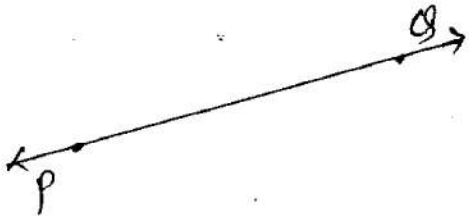


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Q.8 Mark any two points P and Q in your notebook and draw a line passing through the points. How many lines can you draw passing through both the points

Solution:



There is only one line passing through both points.

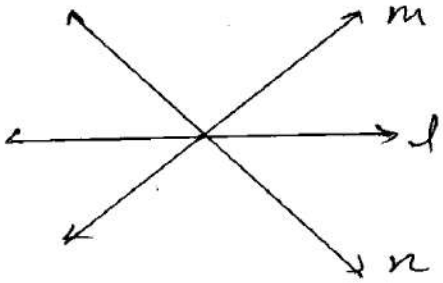
Q.9 Give an example of a horizontal plane and a Vertical Plane from your environment

Solution: Horizontal plane — Ceiling of room

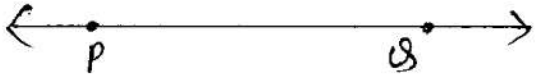
Vertical plane — Wall of room.

Q.10 How many lines may pass through one given point, two given points, any three collinear points.

Solution: There are infinite lines can pass through one given point.



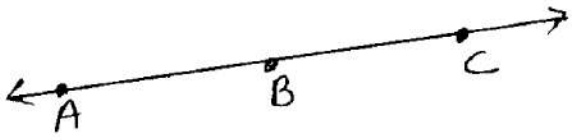
There is only one line can pass through two given points



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There is only one line can pass through these collinear points.



Q.11 Is it ever possible for exactly one line to pass through three points?

Solution: Yes, If three points are collinear.

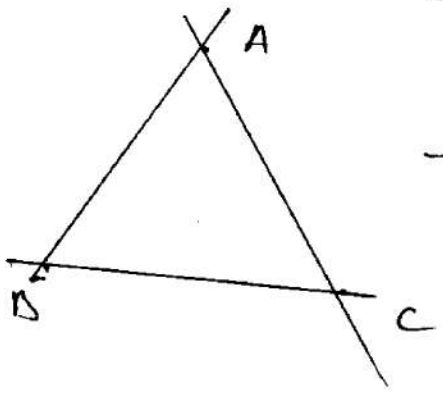
No, If three points are non-collinear.

Q.12 Explain why it is not possible for a line to have a mid point.

Solution: As we know that a line has infinite length. Therefore it is not possible to find a mid point.

Q.13 Mark three non collinear points A, B and C in your notebook. Draw lines through these points taking two at a time. Name these lines. How many such different lines can be drawn?

Solution:



These three lines namely AB, BC and CA.

Three such lines can be drawn.

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Q.14 Coplanar points are the points that are in the same plane. Thus

(i) Can 150 points be coplanar?

(ii) Can 3 points be non coplanar?

Solution: (i) Yes, 150 points can lies in the same plane, so they can be coplanar.

(ii) No, we know that 3 points can be coplanar as we can have plane which contains 3 points

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Q.15 Using a ruler, check whether the following points in fig 10.20 are collinear or not

(i) D, A and C

(ii) A, B and C

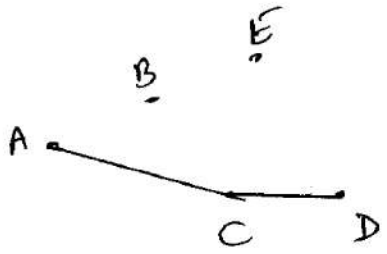
(iii) A, B and E

(iv) B, C and E



Fig 10.20

Solution: (i)

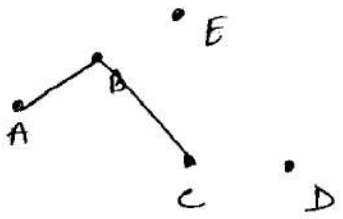


Hence, points are not collinear.

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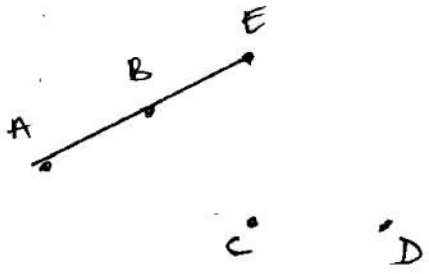
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(ii) A, B and C



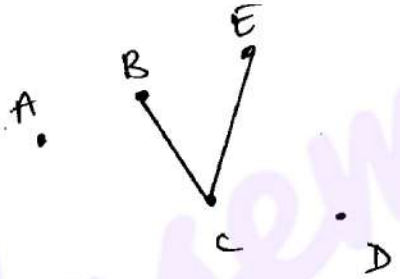
Thus, A, B and C are not collinear.

(iii) A, B and E



Hence, points A, B and E are collinear.

(iv) B, C and E



Q.16 Lines p, q are coplanar. So are the lines p, r. Can we conclude that the lines p, q, r are coplanar.

Solution: Yes, the lines p, q and r are coplanar.

Q.17 Give three examples each of:

(i) Intersecting lines

(ii) Parallel lines from your environment.

Solution: Intersecting lines

(a) Crossing roads

(b) Adjacent edges of rectangle.

(c) Sides of triangle.

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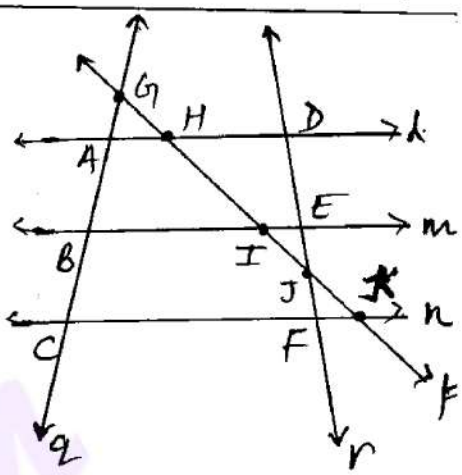
Parallel lines :

(a) opposite edges of Scale.

(b) Railway track

(c) opposite sides of rectangular table top.

Q.18 From fig 10.21, write.



(i) All pairs of parallel lines.

(ii) All pairs of intersecting lines.

(iii) lines whose point of intersection is I

(iv) lines whose point of intersection is D.

(v) lines whose point of intersection is E

(vi) lines whose point of intersection is A

(vii) Collinear points.

Solution (i) ∵ AD || BE || CF, then $l \| m$, $m \| n$, $n \| l$

(ii) (l, p) ; (m, p) ; (n, p); (l, r) ; (m, r) ; (n, r) ; (p, r) ; (l, q); (m, q) : (n, q) ; (q, p) ; (q, r)

(iii) (m, p)

(iv) (l, r)

(v) (m, r)

(vi) (l, q)

(vii) G, A, B, C ; D, E, J, F ; G, H, I, J, K ; A, H, D ; B, I, E ; C, F, K

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Q.19 From fig 10.22, write concurrent lines and their point of concurrence.

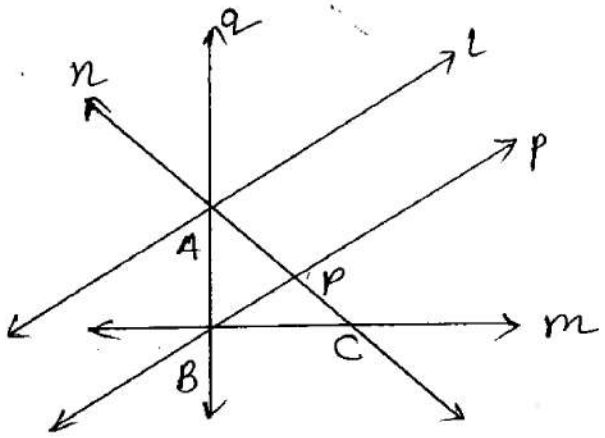


Fig 10.22

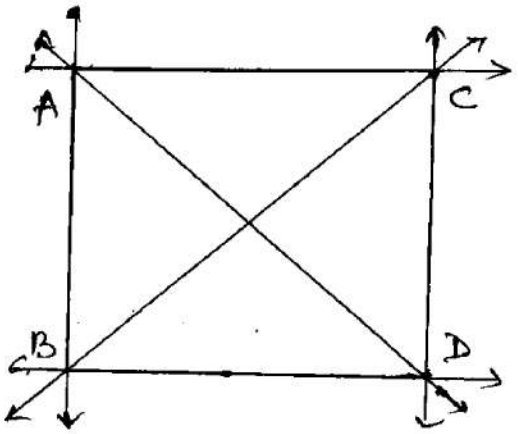


Fig 10.23

Solution:

Fig 10.22 : lines n, q, l → Point of concurrence A

lines q, p, m → Point of concurrence B.

Q.20: Mark four points A, B, C and D in your notebook such that no three of them are collinear. Draw all the lines which join them in pairs as shown in fig 10.2

(i) How many such lines can be drawn

(ii) Write the names of these lines

(iii) Name the lines which are concurrent to A.

Solution: (i) six lines (ii) AB, BC, CD, AD, AC, and BD

~~(iii)~~ (iii) AB, AD, AC

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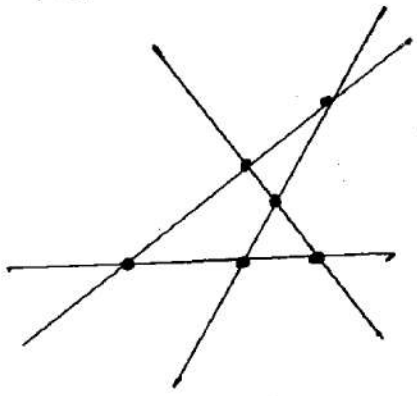
Q.21 What is the maximum number of points of intersection of three lines in a plane? What is the minimum number.

Sol: In a plane Three lines maximum can intersect at 3 points.

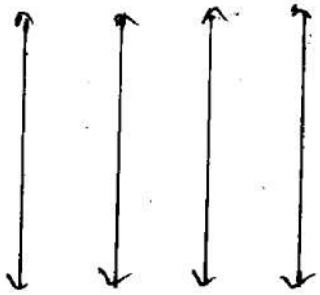
Minimum intersection points are zero.

Q.22 With the help of a figure, find the maximum and minimum number of points of intersection of four lines in a plane.

Solution: The maximum number of points of intersection of four lines in a plane is six.



The minimum number of points of intersection of three lines in a plane is zero.

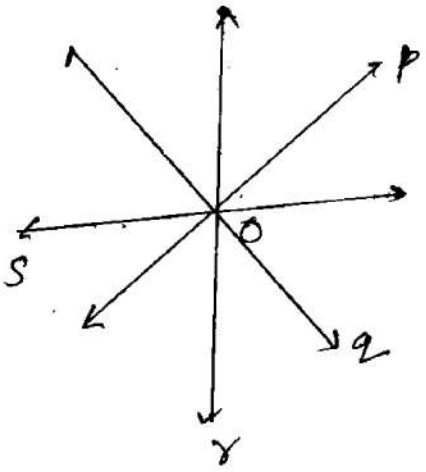


Q.23 Lines p, q and r are concurrent. Also lines p, s and r are concurrent. Draw a figure and state whether lines p, q, r and s are concurrent or not.

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∴ here lines p, q, r are concurrent and meeting at point O.

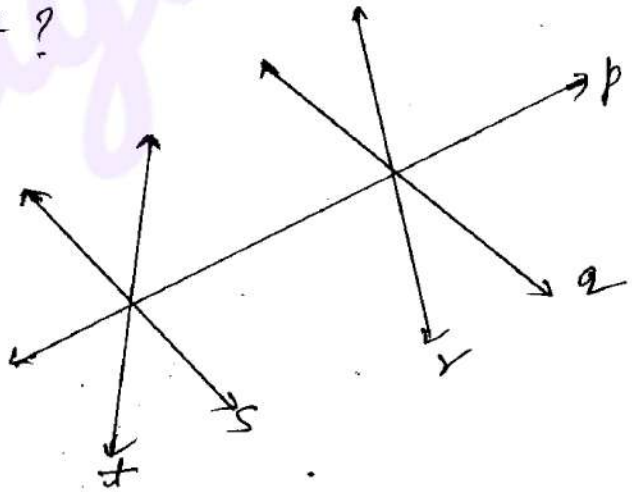


Also lines p, r and s are concurrent and meeting at point O.

Hence, lines P, Q, R, S are concurrent.

Q.24 Lines p, q, r are concurrent. Also lines p, t and s are concurrent. Is it always true that lines q, r and s will be concurrent? Is it always true for lines q, r and t?

Solution



With figure, we can see that lines q, r and s are not concurrent.

Also, lines q, r and t are not concurrent.

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Q.25 : Fill in the blanks in the following statements using suitable words.

(i) A page of a book is a physical example of a .....

(ii) An inkpot has both ..... surfaces.

(iii) Two lines in a plane are either ..... or are .....

Solution : (i) Plane (ii) Curved and plane

(iii) Intersecting, Parallel.

Q.26 State which of the following statements are true (T) and which are false (F)

(i) Point has a size, because we can see it as a thick dot on paper.

(ii) By lines in geometry, we mean only straight lines.

(iii) Two lines in a plane always intersect at a point.

(iv) Any plane through a vertical line is vertical.

(v) Any plane through a horizontal line is horizontal

(vi) There can be a horizontal line in a vertical plane

(vii) All lines in a horizontal plane are horizontal.

(viii) Two lines in a plane always intersect at a point.

(ix) If two lines intersect at a point P, then P is

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called the point of concurrence of the two lines.

(x) If two lines intersect at a point P, then P is called the point of intersection of two lines.

(xi) If A, B, C and D are collinear points. D, P, and Q are collinear. Then points A, B, C, D, P and Q are always collinear.

(xii) Two different lines can be drawn passing through two given points.

(xiii) Through a given point only one line can be drawn.

(xiv) Four points are collinear if any three of them lie on the same line.

(xv) The maximum number of points of intersection of three lines is three.

(xvi) The minimum number of points of intersection of three lines is one.

Solution: (i) False (ii) True (iii) False (iv) True

(v) False (vi) False (vii) False (viii) False

(ix) False (x) True (xi) False (xii) false

(xiii) false (xiv) False (xv) True (xvi) False.

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Q.27 Give the correct matching of the statements of column A and column B.

Column A	Column B
(i) Points are collinear	(a) May be parallel or intersecting
(ii) Points are completely unknown.	(b) are undefined terms i geometry
(iii) Two lines in a plane	(c) If they lie on same li
(iv) Relations between points and lines.	(d) can pass through a poin
(v) Three non collinear points	(e) determine a plane
(vi) A plane extends	(f) are called incidence properties.
(vii) Indefinite number of lines.	(g) If two points are giv
(viii) Point, line and plane are	(h) Indefinitely in all directions.

Solution : (i) → c (ii) → g (iii) → a

(iv) → f (v) → e (vi) → h (vii) → d

(viii) → b

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