7. Coordinate Geometry - Board Exam Questions

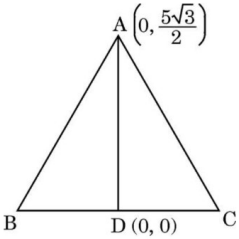
The detailed solution for all the questions can be found at pschool.in/math/ncert/g10/chap-7

1 Mark Questions (MCQ)

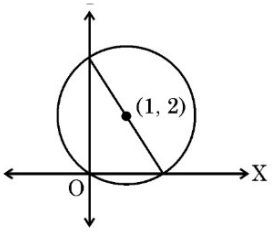
1) The mid-point of the line segment joining the points (5, −4) and (6, 4) lies on:
(a) x-axis (b) y-axis
(c) origin (d) neither x-axis nor y-axis

2) The distance of the point A(4a, 3a) from x-axis is:

3) In the given figure, △ABC is an equilateral triangle. AD is a median of the triangle joining the points $A\left(0, \frac{5\sqrt{3}}{2}\right)$, D(0, 0). Points B and C are (in same order):



4) In the given figure, a circle is centred at (1, 2). The diameter of the circle is



5) The distance between the points (a cos θ + b sin θ, 0) and (0, a sin θ − b cos θ) is

6) The line segment joining the points P(−4, −2) and Q(10, 4) is divided by y-axis in the ratio

7) The point which lies on the perpendicular bisector of the line segment joining the points A(−3, −4) and B(3, 4) is:

8) PM is a median of △PQR with vertices P(5, −6), Q(6, 4) and R(0, 0). The length of PM is:

9) The mid-point of the line segment joining the points P(−4, 5) and Q(4, 6) lies on:
(a) x-axis (b) y-axis

(c) origin (d) neither x-axis nor y-axis

10) The coordinates of the end points of a diameter of a circle are (5, −2) and (5, 2). The length of the radius of the circle is:

11) The points (−5, 0), (5, 0) and (0, 4) are the vertices of a triangle which is a/an:
(a) right-angled triangle
(b) isosceles triangle
(c) equilateral triangle (d) scalene triangle

12) The equation of a line parallel to the x-axis and at a distance of 3 units below x-axis is:

13) The line represented by $\frac{x}{4} + \frac{y}{6} = 1$, intersects x-axis and y-axis respectively at P and Q. The coordinates of the mid-point of line segment PQ are:

14) Two of the vertices of △PQR are P(−1, 5) and Q(5, 2). The coordinates of a point which divides PQ in the ratio 2 : 1 are:

15) AOBC is a rectangle whose three vertices are A(0, 2), O(0, 0) and B(4, 0). The square of the length of its diagonal is equal to:

16) The distance of a point A from x-axis is 3 units. Which of the following cannot be coordinates of the point A?
(a) (1, 3) (b) (−3, −3)
(c) (−3, 3) (d) (3, 1)

17) In the figure given below, points P, Q, R divides the line segment AB in four equal parts.
The point Q divides PB in the ratio



18) The distance of the point A(−3, −4) from x-axis is

19) The shortest distance (in units) of the point (2, 3) from y-axis is

20) The points A(9, 0), B(9, −6), C(−9, 0) and D(−9, 6) are the vertices of a
(a) Square (b) Rectangle
(c) Parallelogram (d) Trapezium

21) If the distance between the points (3, −5) and (x, −5) is 15 units, then the values of x are:

22) The centre of a circle is at (2, 0). If one end of a diameter is at (6,

0), then the other end is at:

23) Point P divides the line segment joining the points A(4, −5) and B(1, 2) in the ratio 5 : 2. Co-ordinates of point P are

24) XOYZ is a rectangle with vertices X(−3, 0), O(0, 0), Y(0, 4) and Z(x, y). The length of its each diagonal is

25) The fourth vertex D of a parallelogram ABCD whose three vertices are A(−2, 3), B(6, 7) and C(8, 3) is:

26) The point on the x-axis nearest to the point (−4, −5) is

27) A point on the x-axis divides the line segment joining the points A(2, −3) and B(5, 6) in the ratio 1 : 2. The point is

28) In what ratio, does x-axis divide the line segment joining the points A(3, 6) and B(−12, −3)?

29) The distance between the points $(0, 2\sqrt{5})$ and $(-2\sqrt{5}, 0)$ is

30) The coordinates of the vertex A of a rectangle ABCD whose three vertices are given as B(0, 0), C(3, 0) and D(0, 4) are:

31) The area of the triangle formed by the line $\frac{x}{a} + \frac{y}{b} = 1$ with the coordinate axes is:

32) The distance of the point (−1, 7) from x-axis is:

33) The distance of the point (−6, 8) from origin is:

34) The distance between the points $P\left(-\frac{11}{3}, 5\right)$ and $Q\left(-\frac{2}{3}, 5\right)$ is:

35) The distance of the point (−6, 8) from x-axis is

36) What is the ratio in which the line segment joining (2, −3) and (5, 6) is divided by x-axis?

37) A point (x, y) is at a distance of 5 units from the origin. How many such points lie in the third quadrant?

38) If the vertices of a parallelogram PQRS taken in order are P(3, 4), Q(−2, 3) and R(−3, −2), then the coordinates of its fourth vertex S are

Assertion and Reason

1) ASSERTION (A): If three vertices of a parallelogram taken in order are (−1, −6), (2, −5) and (7, 2), then its fourth vertex is (4, 1).
REASON (R): Diagonals of a parallelogram bisect each other.

2) ASSERTION (A): The point which divides the line segment joining the points A(1, 2) and B(−1, 1) internally in the ratio 1 : 2 is $\left(\frac{-1}{3}, \frac{5}{3}\right)$.
REASON (R): The coordinates of the point which divides the line segment joining the points A(x_1, y_1) and B(x_2, y_2) in the ratio $m_1 : m_2$ are $\left(\frac{m_1x_2 + m_2x_1}{m_1 + m_2}, \frac{m_1y_2 + m_2y_1}{m_1 + m_2}\right)$.

3) ASSERTION (A): Mid-point of a line segment divides the line segment in the ratio 1 : 1.
REASON (R): The ratio in which the point (−3, k) divides the line segment joining the points (−5, 4) and (−2, 3) is 1 : 2.

4) ASSERTION (A): Point P(0, 2) is the point of intersection of y-axis with the line $3x + 2y = 4$.
REASON (R): The distance of point P(0, 2) from x-axis is 2 units.

5) ASSERTION (A): If the points A(4, 3) and B(x, 5) lie on a circle with centre O(2, 3), then the value of x is 2.
REASON (R): Centre of a circle is the mid-point of each chord of the circle.

6) ASSERTION (A): If the co-ordinates of the mid-points of the sides AB and AC of $\triangle ABC$ are D(3, 5) and E(−3, −3) respectively, then BC = 20 units.
REASON (R): The line joining the mid points of two sides of a triangle is parallel to the third side and equal to half of it.

2 Mark Questions

1) Find the type of triangle ABC formed whose vertices are A(1, 0), B(−5, 0) and C(−2, 5).

2) Prove that the points (3, 0), (6, 4) and (−1, 3) are the vertices of an isosceles triangle.

3) Show that the points A(−5, 6), B(3, 0) and C(9, 8) are the vertices

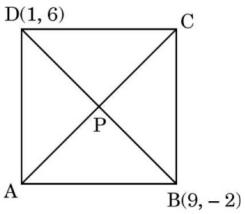
of an isosceles triangle.

4) Show that the points (−2, 3), (8, 3) and (6, 7) are the vertices of a right-angled triangle.

5) Using distance formula, prove that the points A(2, 3), B(−7, 0) and C(−1, 2) are collinear.

6) Vertices of a right triangle ABC with $\angle B = 90^\circ$ are A(3, 4), B(1, 1) and C(−8, 7). Find the value of tan A.

7) Diagonals AC and BD of square ABCD intersect at P. Coordinates of points B and D are (9, −2) and (1, 6) respectively. (i) Find the co-ordinates of point P. (ii) Find the length of the side of the square.



8) Find the point(s) on the x-axis which is at a distance of $\sqrt{41}$ units from the point (8, −5).

9) The coordinates of the centre of a circle are $(x - 7, 2x)$. Find the value(s) of 'x', if the circle passes through the point (−9, 11) and has radius $5\sqrt{2}$ units.

10) The coordinates of the centre of a circle are $(2a, a - 7)$. Find the value(s) of 'a' if the circle passes through the point (11, −9) and has diameter $10\sqrt{2}$ units.

11) Points A(−1, y) and B(5, 7) lie on a circle with centre O(2, −3y) such that AB is a diameter of the circle. Find the value of y. Also, find the radius of the circle.

12) Find a relation between x and y such that the point P(x, y) is equidistant from the points A(7, 1) and B(3, 5).

13) Prove that abscissa of a point P which is equidistant from points with coordinates A(7, 1) and B(3, 5) is 2 more than its ordinate.

14) Point P(x, y) is equidistant from points A(5, 1) and B(1, 5). Prove that $x = y$.

15) Find the coordinates of a point on the line $x + y = 5$ which is equidistant from (6, 4) and (5, 2).

16) The line segment joining the points A(4, −5) and B(4, 5) is divided by the point P such that $AP : AB = 2 : 5$. Find the

coordinates of P.

17) The coordinates of the end points of the line segment AB are A(−2, −2) and B(2, −4). P is the point on AB such that $BP = \frac{4}{7}AB$. Find the coordinates of point P.

18) Find the ratio in which the point P(−4, 6) divides the line segment joining the points A(−6, 10) and B(3, −8).

19) Find the ratio in which y-axis divides the line segment joining the points (5, −6) and (−1, −4).

20) In what ratio is the line segment joining the points (3, −5) and (−1, 6) divided by the line $y = x$?

21) Find the coordinates of the point C which lies on the line AB produced such that $AC = 2BC$, where coordinates of points A and B are (−1, 7) and (4, −3) respectively.

22) A line intersects y-axis and x-axis at point P and Q, respectively. If R(2, 5) is the mid-point of line segment PQ, then find the coordinates of P and Q.

23) A(3, 0), B(6, 4) and C(−1, 3) are vertices of a triangle ABC. Find length of its median BE.

24) If the points A(4, 5), B(m, 6), C(4, 3) and D(1, n) taken in this order are the vertices of a parallelogram ABCD, then find the values of m and n.

<u>3 Mark Questions</u>

1) Find the ratio in which the line segment joining the points (5, 3) and (−1, 6) is divided by Y-axis.

2) Find the ratio in which the y-axis divides the line segment joining the points (5, −6) and (−1, −4). Also find the point of intersection.

3) Find the ratio in which the line segment joining the points A(6, 3) and B(−2, −5) is divided by x-axis.

4) Find the ratio in which the x-axis divides the line segment joining the points (−6, 5) and (−4, −1). Also, find the point of intersection.

5) In what ratio does the x-axis divide the line segment joining the points (−4, −6) and (−1, 7)? Also, find the coordinates of the point of division.

6) A point P(x, 7) divides a line segment joining the points A(−5, 4) and B(7, 9) in a certain ratio. Find the ratio and hence find the value of x.

7) Find the ratio in which the point $\left(\frac{8}{5}, y\right)$ divides the line segment joining the points (1, 2) and (2, 3). Also, find the value of y.

8) P(−2, 5) and Q(3, 2) are two points. Find the coordinates of the point R on line segment PQ such that $PR = 2QR$.

9) Prove that the point P dividing the line segment joining the points A(−1, 7) and B(4, −3) in the ratio 3 : 2, lies on the line $x - 3y = -1$. Also find length of PA and PB.

10) Find the coordinates of the points of trisection of the line segment joining the points A(−1, 4) and B(−3, −2).

11) Find the coordinates of the points which divide the line segment joining A(−2, 2) and B(2, 8) into four equal parts.

12) If the mid-point of the line segment joining the points A(3, 4) and B(k, 6) is P(x, y) and $x + y - 10 = 0$, then find the value of k.

13) If Q(0, 1) is equidistant from P(5, −3) and R(x, 6), find the values of x.

14) A circle centered at (2, 1) passes through the points A(5, 6) and B(−3, K). Find the value(s) of K. Hence find length of chord AB.

15) Find a relation between x and y such that P(x, y) is equidistant from the points A(3, 5) and B(7, 1). Hence, write the coordinates of the points on x-axis and y-axis which are equidistant from points A and B.

16) P(x, y), Q(−2, −3) and R(2, 3) are the vertices of a right triangle PQR right angled at P. Find the relationship between x and y. Hence, find all possible values of x for which $y = 2$.

17) If (−5, 3) and (5, 3) are two vertices of an equilateral triangle, then find co-ordinates of the third vertex, given that origin lies

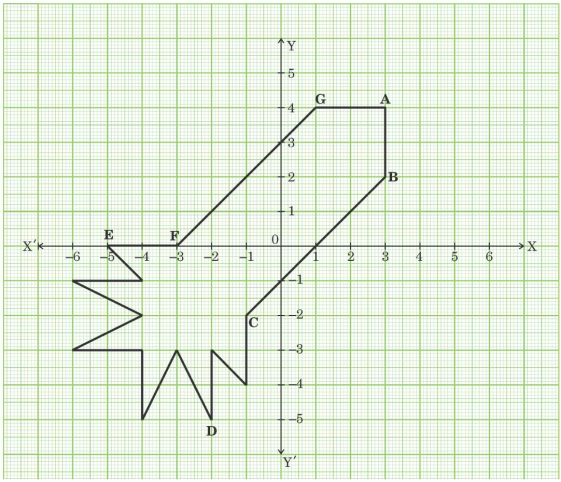
inside the triangle. (Take $\sqrt{3} = 1.7$)

18) If the points A(6, 1), B(p, 2), C(9, 4) and D(7, q) are the vertices of a parallelogram ABCD, then find the values of p and q. Hence, check whether ABCD is a rectangle or not.

19) ABCD is a rectangle formed by the points A(−1, −1), B(−1, 6), C(3, 6) and D(3, −1). P, Q, R and S are mid-points of sides AB, BC, CD and DA respectively. Show that diagonals of the quadrilateral PQRS bisect each other.

4 Mark Questions

1) Ryan, from a very young age, was fascinated by the twinkling of stars and the vastness of space. He always dreamt of becoming an astronaut one day. So he started to sketch his own rocket designs on the graph sheet. One such design is given below:



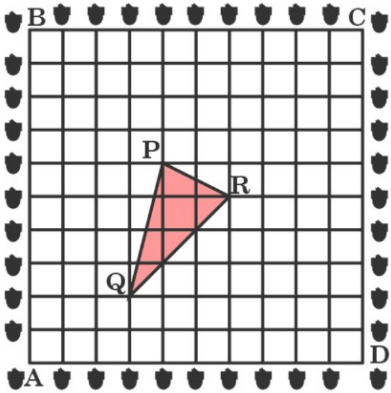
(i) Find the mid-point of the segment joining F and G. (1)

(ii) (a) What is the distance between the points A and C? (2)

OR (b) Find the coordinates of the point which divides the line segment joining the points A and B in the ratio 1 : 3 internally.

(iii) What are the coordinates of the point D? (1)

2) A garden is in the shape of a square. The gardener grew saplings of Ashoka tree on the boundary of the garden at the distance of 1 m from each other. He wants to decorate the garden with rose plants. He chose a triangular region inside the garden to grow rose plants. In the above situation, the gardener took help from the students of class 10. They made a chart for it which looks like the given figure.



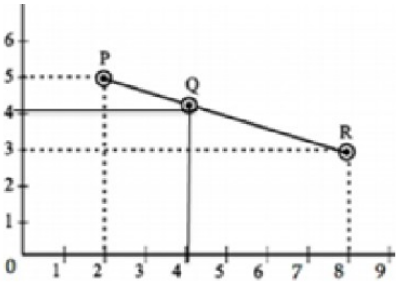
(i) If A is taken as origin, what are the coordinates of the vertices of △PQR? (1)

(ii) (a) Find distances PQ and QR. (2)

OR (b) Find the coordinates of the point which divides the line segment joining points P and R in the ratio 2 : 1 internally.

(iii) Find out if △PQR is an isosceles triangle. (1)

3) A group of class X students goes to picnic during winter holidays. The position of three friends Aman, Kirti and Chahat are shown by the points P, Q and R.



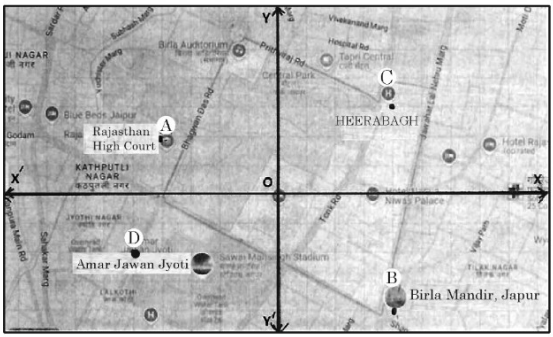
(i) Find the distance between P and R. (1)

(ii) Is Q, the midpoint of PR? Justify by finding midpoint of PR. (1)

(iii) Find the point on x-axis which is equidistant from P and Q. (2)

OR Let S be a point which divides the line joining PQ in ratio 2 : 3. Find the coordinates of S.

4) Observe the map of Jaipur city placed on a Cartesian plane. Taking Rambagh Palace as origin, the location of some places are given below: Point A: (−4, 2) Rajasthan High Court · Point B: (4, −4) Birla Mandir · Point C: (4, 3) Heera Bagh · Point D: (−5, −2) Amar Jawan Jyoti



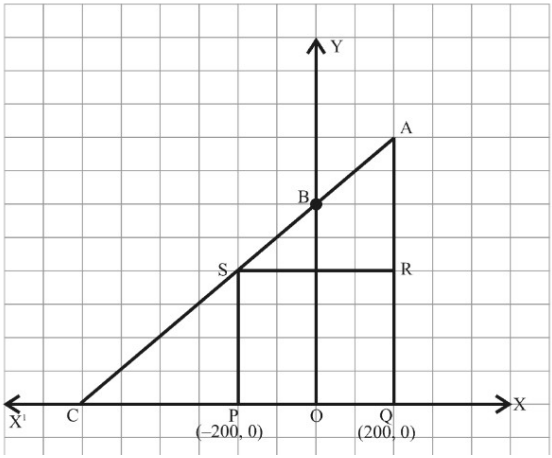
(i) Advocate Rehana stays at Heera Bagh. How much distance she has to cover daily to go to the court and coming back home? (1)

(ii) There is a crossing on X-axis which divides AD in a certain ratio. Find the ratio. (1)

(iii) (a) Is Birla Mandir equidistant from Heera Bagh and Amar Jawan Jyoti? Justify your answer. (2)

OR (b) Using section formula, show that points A, O and B are not collinear.

5) Jagdish has a field which is in the shape of a right angled triangle AQC. He wants to leave a space in the form of a square PQRS inside the field for growing wheat and the remaining for growing vegetables (as shown in the figure). In the field, there is a pole marked as O.

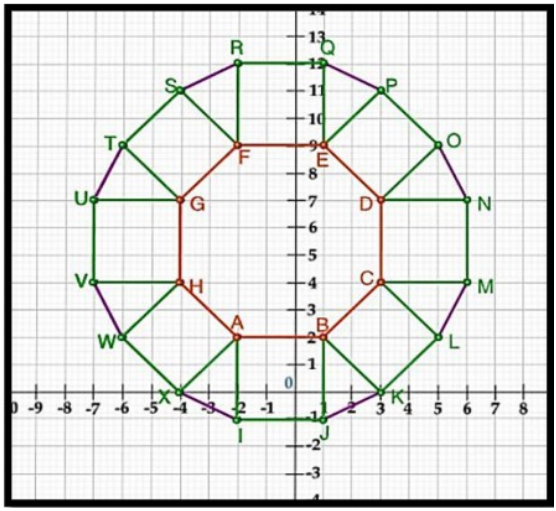


(i) Taking O as origin, coordinates of P are (−200, 0) and of Q are

(200, 0). PQRS being a square, what are the coordinates of R and S? (1)
(ii) (a) What is the area of square PQRS? (2)
OR (b) What is the length of diagonal PR in square PQRS?
(iii) If S divides CA in the ratio K : 1, what is the value of K, where point A is (200, 800)? (1)

6) Tharunya was thrilled to know that the football tournament is fixed with a monthly timeframe from 20th July to 20th August 2023 and for the first time in the FIFA Women's World Cup's history, two nations host in 10 venues. Her father felt that the game can be better understood if the position of players is represented as points on a coordinate plane.
(i) At an instance, the midfielders and forward formed a parallelogram. Find the position of the central midfielder (D) if the position of other players who formed the parallelogram are: A(1, 2), B(4, 3) and C(6, 6). (1)
(ii) Check if the Goal keeper G(−3, 5), Sweeper H(3, 1) and Wing-back K(0, 3) fall on a same straight line. (2)
OR Check if the Full-back J(5, −3) and centre-back I(−4, 6) are equidistant from forward C(0, 1) and if C is the mid-point of IJ.
(iii) If Defensive midfielder A(1, 4), Attacking midfielder B(2, −3) and Striker E(a, b) lie on the same straight line and B is equidistant from A and E, find the position of E. (1)

7) A tiling or tessellation of a flat surface is the covering of a plane using one or more geometric shapes, called tiles, with no overlaps and no gaps. Historically, tessellations were used in ancient Rome and in Islamic art. You may find tessellation patterns on floors, walls, paintings etc. Shown below is a tiled floor in the archaeological Museum of Seville, made using squares, triangles and hexagons.



A craftsman thought of making a floor pattern after being inspired by the above design. To ensure accuracy in his work, he made the pattern on the Cartesian plane. He used regular octagons, squares and triangles for his floor tessellation pattern.
Use the above figure to answer the questions that follow:
(i) What is the length of the line segment joining points B and F? (1)
(ii) The centre 'Z' of the figure will be the point of intersection of the diagonals of quadrilateral WXOP. Then what are the coordinates of Z? (1)
(iii) What are the coordinates of the point on y axis equidistant from A and G? (2)
OR What is the area of Trapezium AFGH?