Date: 29/9/2021

Q1. Find the distance between the points (a) $P(-6, 7)$ and $Q(-1, -5)$, (ii) $R(a + b, a - b)$ and $S(a - b, -a - b)$, and (iii) $A(at_1^2, 2at_1)$ and $B(at_2^2, 2at_2)$

Q2. Find the distance between the following pair of points:

(i) $(-6, 7)$ and $(-1, -5)$ (ii) $(a + b, b + c)$ and $(a - b, c - b)$

(iii) $(a \sin \alpha, -b \cos \alpha)$ and $(-a \cos \alpha, b \sin \alpha)$ (iv) $(a, 0)$ and $(0, b)$

Q3. Write the distance between the points $A(10 \cos \theta, 0)$ and $B(0, 10 \sin \theta)$

Q4. What is the distance between the points $(5 \sin 60°, 0)$ and $(0, 5 \sin 30°)$?

Q5. Write the coordinates the reflections of point (3, 5) in X and Y-axis.

Q6. Find the coordinates of the point which divides the line segment joining the points (6, 3) and (–4, 5) in the ratio 3 : 2 internally.

Q7. If A and B are (1, 4) and (5, 2) respectively, find the coordinates of P when $AP/BP = 3/4$.

Q8. Find the area of a triangle whose vertices are $A(3, 2)$, $B(11, 8)$ and $C(8, 12)$.

Q9. Find the area of the triangle fromed by the points $A(5, 2)$, $B(4, 7)$ and $C(7, -4)$.

Q10. Find the coordinates of the centroid of a triangle whose vertices are (0, 6), (8, 12) and (8, 0).

Q11. If $x - 2y + k = 0$ is a median of the triangle whose vertices are at points $A(-1, 3)$, $B(0, 4)$ and $C(-5, 2)$, find the vale of k.

Q12. Two vertices of a triangle are (3, –5) and (–7, 4). If its centroid is (2, –1), find the third vertex.

Q13. Two vertices of a triangle are (1, 2), (3, 5) and its centroid is at the origin. Find the coordinates of the third vertex.

Q14. The distance between the points $(\cos \theta, \sin \theta)$ and $(\sin \theta - \cos \theta)$ is

(a) $\sqrt{3}$ (b) $\sqrt{2}$ (c) 2 (d) 1

Q15. The distance between the points $(a \cos 25°, 0)$ and $(0, a \cos 65°)$ is

(a) a (b) $2a$ (c) $3a$ (d) None of these

Q16. If the distance between the points $(4, p)$ and (1, 0) is 5, then $p =$

(a) ± 4 (b) 4 (c) –4 (d) 0

Q17. The distance between the points $(a \cos \theta + b \sin \theta, 0)$ and $(0, a \sin \theta - b \cos \theta)$ is

(a) $a^2 + b^2$ (b) $a + b$ (c) $a^2 - b^2$ (d) $\sqrt{a^2 + b^2}$

Q18. If x is a positive integer such that the distance between points $P(x, 2)$ and $Q(3, -6)$ is 10 units, then $x =$

(a) 3 (b) –3 (c) 9 (d) –9

Q19. The perimeter of the triangle formed by the points (0, 0), (1, 0) and (0, 1) is

(a) $1 \pm \sqrt{2}$ (b) $\sqrt{2} + 1$ (c) 3 (d) $2 + \sqrt{2}$

Q20. If three points (0, 0) (3, $\sqrt{3}$) and (3, λ) form an equilateral triangle, then λ =

(a) 2 (b) – 3 (c) – 4 (d) None of these

Q21. If the points (k, $2k$), ($3k$, $3k$) and (3, 1) are collinear, than k =

(a) $\frac{1}{3}$ (b) $-\frac{1}{3}$ (c) $\frac{2}{3}$ (d) $-\frac{2}{3}$

Q22. The coordinates of thepoint on X-axis which are equidistant from the points (– 3, 4) and (2, 5) are

(a) (20, 0) (b) (– 23, 0) (c) $\left(\frac{4}{5}, 0\right)$ (d) None of these

Q23. If (– 1, 2), (2, – 1) and (3, 1) are any three vertices of a parallelogram, then

(a) $a = 2,\ b = 0$ (b) $a = -2,\ b = 0$ (c) $a = -2,\ b = 6$ (d) $a = 6,\ b = 2$

Q24. If A (5, 3), B (11, – 5) and P (12, y) are the vertices of a right triangle right angled at P, then y =

(a) – 2, 4 (b) – 2, – 4 (c) 2, – 4 (d) 2, 4

Q25. If (x, 2), (– 2, – 4) and (7, – 5) are collinear, then x =

(a) 60 (b) 63 (c) – 63 (d) – 60

Q26. If the area of the triangle formed by the points (x, $2x$), (– 2, 6) and (3, 1) is 5 square units, then x =

(a) $\frac{2}{3}$ (b) $\frac{3}{5}$ (c) 3 (d) 5

Q27. If points (t, $2t$), (– 2, 6) and (3, 1) are collinear, then t =

(a) $\frac{3}{4}$ (b) $\frac{4}{3}$ (c) $\frac{5}{3}$ (d) $\frac{3}{5}$

Q28. If point (a, 0), (0, b) and (1, 1) are collinear, then $\frac{1}{a} + \frac{1}{b} =$

(a) 1 (b) 2 (c) 0 (d) – 1

Q29. The ratio in which the x-axis divides the segment joining (3, 6) and (12, – 3) is

(a) 2 : 1 (b) 1 : 2 (c) – 2 : 1 (d) 1 : – 2

Q30. If the centroid of the triangle formed by the points (a, b), (b, c) and (c, a) is at the origin, then $a^3 + b^3 + c^3 =$

(a) abc (b) 0 (c) $a + b + c$ (d) $3\,abc$

Q31. If points (1, 2), (– 5, 6) and (a, – 2) are collinear, than a =

(a) – 3 (b) 7 (c) 2 (d) – 2

Q32. If the centroid of the triangle formed by (7, x), (y, – 6) and (9, 10) is at (6, 3), then (x, y) =

(a) (4, 5) (b) (5, 4) (c) (– 5, – 2) (d) (5, 2)

Q33. The distance of the point (4, 7) from the y-axis is

(a) 4 (b) 7 (c) 11 (d) $\sqrt{65}$

Q34. The distance of the point (4, 7) from the x-axis is

(a) 4 (b) 7 (c) 11 (d) $\sqrt{65}$

Q35. If the point (x, 4) lies on a circle whose centre is at the origin and radius is 5, then x =

(a) ± 5 (b) ± 3 (c) 0 (d) ± 4

Q36. If points A (5, p), B (1, 5), C (2, 1) and D (6, 2) form a square $ABCD$, then p =

(a) 7 (b) 3 (c) 6 (d) 8

Q37. If the centroid of the triangle formed by the points (3, – 5), (– 7, 4), (10, – k) isat the point (k, – 1), then k =

(a) 3 (b) 1 (c) 2 (d) 4

Q38. If (– 2, 1) is the centroid of the triangle having its vertices at (x, 0), (5, – 2), (– 8, y), then x, y satisfy the relation

(a) $3x + 8y = 0$ (b) $3x - 8y = 0$ (c) $8x + 3y = 0$ (d) $8x = 3y$

Q39. If the line segment joining the points (3, – 4) and (1, 2) is trisected at points $P(a, -2)$ and $Q\left(\frac{5}{3}, b\right)$. Then

(a) $a = \frac{8}{3},\ b = \frac{2}{3}$ (b) $a = \frac{7}{3},\ b = 0$ (c) $a = \frac{1}{3},\ b = 1$ (d) $a = \frac{2}{3},\ b = \frac{1}{3}$

Q40. If the coordinates of one end of a diameter of a circle are (2, 3) and the coordinates of its centre are (– 2, 5), then the coordinates of the other end of the diameter are

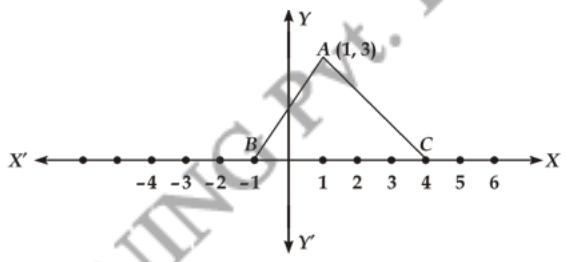
(a) (– 6, 7) (b) (6, – 7) (c) (6, 7) (d) (– 6, – 7)

Q41. The coordinates of the point P dividing the line segment joining the points A (1, 3) and B (4, 6) in the ratio 2 : 1 are

(a) (2, 4) (b) (3, 5) (c) (4, 2) (d) (5, 3)

Q42. In figure, the area of ΔABC (in square units) is

(a) 15 (b) 10 (c) 7.5 (d) 2.5



Q43. The point on the x-axis which is equidistant from points (– 1, 0) and (5, 0) is

(a) (0, 2) (b) (2, 0) (c) (3, 0) (d) (0, 3)

Q44. If A (4, 9), B (2, 3) and C (6, 5) are the vertices of ΔABC, then the length of median through C is

(a) 5 units (b) $\sqrt{10}$ units (c) 25 units (d) 10 units

Q45. The perimeter of a triangle with vertices (0, 4) and (0, 0) and (3, 0) is

(a) $7 + \sqrt{5}$ (b) 5 (c) 10 (d) 12

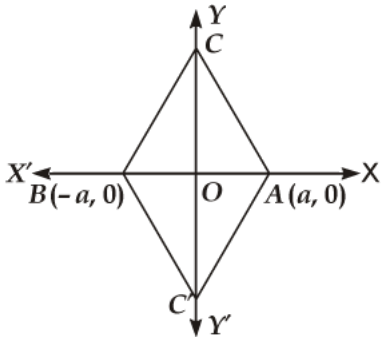
Q46. If A (x, 2), B (– 3, – 4) and C (7, – 5) are collinear, then the value of x is

(a) – 63 (b) 63 (c) 60 (d) – 60

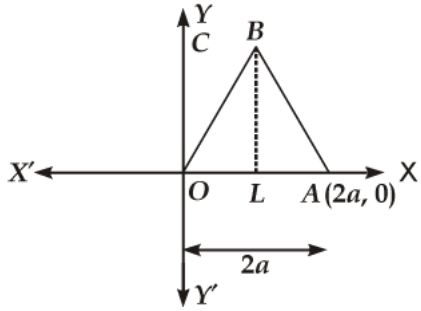
Q47. If P (2, 4), Q (0, 3), R (3, 6) and S (5, y) are the vertices of a parallelogram $PQRS$, then the value of y is

(a) 7 (b) 5 (c) – 7 (d) – 8

Q48. The base AB of two equilateral triangles ABC and ABC' with side $2a$ lies along the X-axis such that the mid-point of AB is at the origin as shown in figure. Find the coordinates of the vertices C and C' of the triangles.



Q49. Find the coordinates of the vertices of an equilateral triangle of side $2a$ as shown in figure.



Q50. If the point (x, y) is equidistant from the points $(a + b, b - a)$ and $(a - b, a + b)$, prove that $bx = ay$.

Q51. Find the equation of the perpendicular bisector of AB, where A and B are the points (3, 6) and (– 3, 4) respectivelt. Also, find its point of intersection with (i) x-axis (ii) y-axis.

Q52. Find the value of x, if the distance between the points $(x, -1)$ and (3, 2) is 5.

Q53. Find the value of a when the distance between the points $(3, a)$ and (4, 1) is $\sqrt{10}$.

Q54. If the points (2, 1) and (1, – 2) are equidistant from the point (x, y), show that $x + 3y = 0$.

Q55. The length of a line segment is of 10 units and the coordinates of one end-points are (2, – 3). If the abscissa of the other end is 10, find the ordinate of the other end.

Q56. Show that the points A (1, – 2), B (3, 6), C (5, 10) and D (3, 2) are the veertices of a parallelogram.

Q57. Prove that the points $(2a, 4a)$, $(2a, 6a)$ and $(2a + \sqrt{3}a, 3a)$ are the vertices of an equilateral triangle.

Q58. Prove that the points (2, 3), (– 4, – 6) and (1, 3/2) do not form a triangle.

Q59. Show that the equdrilateral whose vertices are (2, – 1), (3, 4), (– 2, 3) and (– 3, – 2) is a rhombus.

Q60. Which point on x-axis is equidistant from (5, 9) and (– 4, 6)?

Q61. Prove that the points (– 2, 5), (0, 1) and (2, – 3) are collinear.

Q62. The coordinates of the point P are (– 3, 2). Find the coordinates of the point Q which lies on the line joining P and origin suc that $OP = OQ$.

Q63. Which point on y-axis is equidistant from (2, 3) and (– 4, 1)?

Q64. The three vertices of a parallelogram are (3, 4), (3, 8) and (9, 8). Find the fourth vertex.

Q65. Find the value of k, if the point P (0, 2) is equidistant from $(3, k)$ and $(k, 5)$.

Q66. Write the perimeter of the triangle formed by the points O (0, 0), A $(a, 0)$ and B $(0, b)$.

Q67. If the distance between points $(x, 0)$ and (0, 3) is 5, what are the values of x?

Q68. If the point C (– 1, 2) divides internally the line segment joining A (2, 5) and B in ratio 3 : 4, find the coordinates of B.

Q69. In what ratio does the point C (3/5, 11/5) divide the line segment joining the points A (3, 5) and B (– 3, – 2)?

Q70. If points Q and R reflections of point P (– 3, 4) in X and Y axes respectively, what is QR?

Q71. Write the coordinates ofa point on X-axis which is equidistant from the points (– 3, 4) and (2, 5)

Q72. If the centroid of the triangle formed by points P (a, b), Q (b, c) and R (c, a) is at the origin, what is the value of $a + b + c$?

Q73. Prove that the points (– 2, – 1), (1, 0), (4, 3) and (1, 2) are the vertices of a parallelogram. Is it a rectangle?

Q74. The three vertices of a parallelogram taken in order are (– 1, 0), (3, 1) and (2, 2) respectively. Find the coordinates of the fourth vertex.

Q75. The coordinates of one end point of a diameter of a circle are (4, – 1) and the coordinates of the centre of the circle are (1, – 3). Find the coordinates of the other end of the diameter.

Q76. If the points A (6, 1), B (8, 2), C (9, 4) and D (p, 3) are the vertices of a parallelogram, taken in order, find the value of p.

Q77. Find the lengths of the medians of a ΔABC whose vertices are A (7, – 3), B (5, 3) and C (3, – 1).

Q78. Find the coordinates of the point where the diagonals of the parallelogram formed by joining the points (– 2, – 1), (1, 0), (4, 3) and (1, 2) meet.

Q79. Find the distance of the point (1, 2) from the mid-point of the line segment joining the points (6, 8) and (2, 4).

Q80. Show that A (6, 4), B (5, – 2) and C (7, – 2) are the vertices of an isosceles triangle. Also, ind the length of the median through A.

Q81. Show that the points (1, – 1), (5, 2) and (9, 5) are collinear.

Q82. The x-coordinate of a point P is twice its y-coordinate. If P is equidistant from Q (2, – 5) and R (– 3, 6), then find the coordinates of P.

Q83. Find a point on x-axis which is equidistant from A (2, – 5) and B (– 2, 9).

Q84. If the points A (4, 3) and B (x, 5) are on the circle with centre O (2, 3), find the value of x.

Q85. If (x, y) be on the line joining the two points (1, – 3) and (– 4, 2), prove that $x = y + 2 = 0$.

Q86. For what value of a the point (a, 1), (1, – 1) and (11, 4) are collinear?

Q87. Prove that the points (2, – 2), (– 3, 8) and (– 1, 4) are collinear.

Q88. If A (5, 2), B (2, – 2) and C (– 2, t) are the vertices of right angled triangle with $\angle B = 90°$, then find the value of t.

Q89. Show that the points (– 4, – 1), (– 2, – 4), (4, 0) and (2, 3) are the vertices points of a rectangle.

Q90. Prove that the points (3, 0), (6, 4) and (– 1, 3) are vertices of a right-angled isosceles triangle.

Q91. Find a point on the x-axis which equidistant from the points (7, 6) and (– 3, 4).

Q92. (i) Show that the points A (5, 6), B (1, 5), C (2, 1) and D (6, 2) are the vertices of a square.

(ii) Prove that the points A (2, 3), B (– 2, 2), C (– 1, – 2) and D (3, – 1) are the vertices of a square $ABCD$.

Q93. Find the point on x-axis which is equidistant from the points (– 2, 5) and (2, – 3).

Q94. Prove that the points (0, 0), (5, 5) and (– 5, 5) are the vertices of a right isosceles triangle.

Q95. If the point P (x, y) is equidistant from the points A (5, 1) and B (1, 5), prove that $x = y$.

Q96. Find a point on y-axis which is eqidistant from the points (5, – 2) and (– 3, 2).

Q97. Prove that the points (7, 10), (– 2, 5) and (3, – 4) are the vertices of an isosceles right triangle.

Q98. Find the ratio in which the points P (3/4, 5/12) divides the line segments joining the points A (1/2, 3/2) and B (2, – 5).

Q99. Find the value of k if points $(k, 3)$, $(6, -2)$ and $(-3, 4)$ are collinear.

Q100. Find the coordinates of the circumcentre of the triangle whose vertices are (8, 6), (8, – 2) and (2, – 2). Also, find its circum-radius.

Q101. Prove that points (– 3, 0), (1, – 3) and (4, 1) are the vertices of an isosceles right-angled triangle. Find the area of this triangle.

Q102. Find the values of x, y if the distances of the point (x, y) from (– 3, 0) as well as from (3, 0) are 4.

Q103. Prove that (2, – 2), (– 2, 1) and (5, 2) are the vertices of a right angled triangle. Find the area of the triangle and the length of the hypotenuse.

Q104. An equilateral triangle has two vertices at the points (3, 4) and (– 2, 3), find the coordinates of the third vertex.

Q105. Two vertices of an isosceles triangles are (2, 0) and (2, 5). Find the third vertex if the length of the equal sides is 3.

Q106. Find the centre of the circle passing through (6, – 6), (3, – 7) and (3, 3).

Q107. Find the coordinates of the circumcentre of the triangle whose vertices are (3, 0), (– 1, – 6) and (4, – 1). Also, find its circumradius.

Q108. Show that the points (– 3, 2), (– 5, – 5), (2, – 3) and (4, 4) are the vertices of a rhombus. Find the area of this rhombus.

Q109. Find the centre of the circle passing through (5, – 8), (2, – 9) and (2, 1).

Q110. Find the circumcentre of the triangle whose vertices are (– 2, – 3), (– 1, 0), (7, – 6).

Q111. In what ratio does the x-axis divide the line segment joining the points (2, – 3) and (5, 6)? Also, find the coordinates of the point of intersection.

Q112. In what ratio does the y-axis divide the line segment joining the point P (– 4, 5) and Q (3, – 7)? Also, find the coordinates of the point of intersection.

Q113. Find the ratio in which the point $(-3, p)$ divides the line segment joining the points (– 5, – 4) and (– 2, 3). Hence, find the value of p.

Q114. Prove that (4, – 1), (6, 0), (7, 2) and (5, 1) are the vertices of a rhombus. Is it a square?

Q115. Prove that the points (3, – 2), (4, 0), (6, – 3) and (5, – 5) are the vertices of a parallelogram.

Q116. Three consecutive vertices of a parallelogram are (– 2, – 1), (1, 0) and (4, 3). Find the fourth vertex.

Q117. The points (3, – 4) and (– 6, 2) are the extremities of a diagonal of a parallelogram. If the third vertex is (– 1, – 3). Find the coordinates of the fourth vertex.

Q118. If the mid-point of the line joining (3, 4) and $(k, 7)$ is (x, y) and $2x + 2y + 1 = 0$, find the value of k.

Q119. Determine the ratio in which the straight line $x - y - 2 = 0$ divides the line segment joining (3, – 1) and (8, 9).

Q120. Three vertices of a parallelogram are $(a + b, a - b)$, $(2a + b, 2a - b)$ and $(a - b, a + b)$. Find the fourth vertex.

Q121. If two vertices of a parallelogram are (3, 2), (– 1, 0) and the diagonals cut at (2, – 5), find the other vertices of the parallelogram.

Q122. If the points (– 2, – 1), (1, 0), $(x, 3)$ and $(1, y)$ form a parallelogram, find the values of x and y.

Q123 If three consecutive vertices of a parallelogram are (1, – 2), (3, 6) and (5, 10), find its fourth vertex.

Q124 If the points A (a, – 11), B (5, b), C (2, 15) and D (1, 1) are the vertices of a parallelogram $ABCD$, find the values of a and b.

Q125 Find the coordinates of the points which divide the line segment joining the points (– 4, 0) and (0, 6) in four equal parts.

Q126 Prove that analytically that the line segment joining the middle points of two sides of a triangle is equal to half of the third side.

Q127 Prove that the diagonals of a rectangle bisect each other and are equal.

Q128 Find the area of the quadrilateral $ABCD$ whose vertices are respectively A (1, 1), B (7, – 3), C (12, 2) and D (7, 21).

Q129 Prove that the area of triangle whose vertices are (t, t – 2), (t + 2, t + 2) and (t + 3, t) is independent of t.

Q130 For what value of k are the points (k, 2 – 2k) (– k + 1, 2k) and (– 4 – k, 6 – 2k) are collinear?

Q131 Find the condition that the point (x, y) may lie on the line joining (3, 4) and (– 5, – 6).

Q132 The coordinates of A, B, C are (6, 3), (– 3, 5) and (4, – 2) respectively and P is any point (x, y). Show that the ratio of the areas of triangles PBC and ABC is $\left|\frac{x+y-2}{7}\right|$.

Q133 The four vertices of a quadrilateral are (1, 2), (– 5, 6), (7, – 4) and (k, – 2) taken in order. If the area of the quadrilateral is zero, find the value of k.

Q134 Prove that the points (a, 0), (0, b) and (1, 1) are collinear if, $\frac{1}{a}+\frac{1}{b}=1$.

Q135 The point A divides the join of P (– 5, 1) and A (3, 5) in the ratio k : 1. Find the two vales of k for which the area of ΔABC where B is (1, 5) and C (7, – 2) is equal to 2 units.

Q136 The area of a triangle is 5. Two of its vertices are (2, 1) and (3, – 2). The third vertex lies on $y = x + 3$. Find the third vertex.

Q137 Four points A (6, 3), B (– 3, 5), C (4, – 2) and D (x, 3x) are given insuch a way that $\frac{\Delta DBC}{\Delta ABC}=\frac{1}{2}$, find x.

Q138 Use analytical geometry to prove that the mid-point of the hypotenuse of a right-angled triangle is equidistant from its vertices.

Q139 Show that the points (a, a) (– a, – a) and ($\sqrt{3}\,a$, $\sqrt{3}\,a$) are the vertices of an equilateral triangle. Also, find its area.

Q140 Show that four points (0, – 1), (6, 7), (– 2, 3) and (8, 3) are the vertices of a rectangle. Also, find its area.

Q141 If P (2, – 1), Q (3, 4), R (– 2, 3) and S (– 3, – 2) be four points in a plane, show that $PQES$ is a rhombus but not a square. Find the area of the rhombus.

Q142 Find the coordinates of the centre of the circle passing through the points (0, 0), (– 2, 1) and (– 3, 2). Also find its radius.

Q143 If (– 4, 0) and (4, 0) are two vertices of an equilateral triangle, find the coordinates of its third vertex.

Q144 Points A (– 1, y) and B (5, 7) lie on a circle with centre O (2, – 3y). Find the values of y. Hence, find the radius of the circle.

Q145 Find the value of x such that $PQ = QR$ where the coordinates of P, Q and R are (6, – 1), (1, 3) and (x, 8) respectively.

Q146 If a point A (0, 2) is equidistant from the points B (3, p) and C (p, 5), then find the value of p.

Q147 If the point P (x, 3) is equidistant from the points A (7, – 1) and B (6, 8), find the value of x and find the distance AP.

Q148 If A (3, y) is equidistant from points P (8, – 3) and Q (7, 6), find the value of y and find the distance AQ.

Q149 A point P divides the line segment joining the points A (3, –5), and B (–4, 8) such that $\frac{AP}{PB} = \frac{k}{1}$. If P lies on the line $x + y = 0$, then find the value of k.

Q150 If the points A (6, 1), B (8, 2), C (9, 4) and D (k, p) are the vertices of a parallelogram taken in order, then find the values of k and p.

Q151 Find the ratio in which the y-axis divides the line segment joining the points (5, – 6) and (– 1, – 4). Also, find the coordinates of the point of division.

Q152 If A and B are two points having coordinates (– 2, – 2) and (2, – 4) respectively, find the coordinates of P such that $AP = \frac{3}{7} AB$.

Q153 If the point P (k – 1, 2) is equidistant from the points A (3, k) and B (k, 5), find the values of k.

Q154 If the point A (0, 2) is equidistant from the points B (3, p)and C (p, 5), find p, Also, find the length of AB.

Q155 If the point P (2, 2) is equidistant from the points A (– 2, k) and B (– 2k, – 3), find k. Also, find the length of AP.

Q156 If (0, – 3) and (0, 3) are the two vertices of an equilateral triangle, find the coordinates of its third vertex.

Q157 Points P, Q, R and S divide the line segment joining the points A (1, 2) and B (6, 7) in 5 equal parts. Find the coordinates of the points P, Q and R.

Q158 Find the ratio in which the point P (– 1, y) lying on the line segment joining A (– 3, 10) and B (6, – 8) divides it. Also, find the value of y.

Q159 The mid-point P of the segment joining the points A (–10, 4) and B (– 2, 0) lies on the line segment joining the points C (– 9, – 4) and D (– 4, y). Find the ratio in which P divides CD. Also, find the value of y.

Q160 Find the ratio in which the line segment joining the points A (3, – 3), and B (– 2, 7) is divided by x-axis. Also, find the coordinates of the point of division.

Q161 Find the ratio in which the point P (x, 2) divides the line segment joining the points A (12, 5) and B (4, – 3). Also, find th value of x.

Q162 If the points P, Q (x, 7), R, S (6, y) in this order divide the line segment joining A (2, p) and B (7, 10) in 5 equal parts, find x, y and p.

Q163 If A (4, – 6), B (3, – 2) and C (5, 2) are the vertices of ΔABC, then verify the fact that a median of a triangle ABC divides it into two triangles of equal areas.

Q164 Find the area of the triangle ABC with A (1, – 4) and mid-points of sides through A being (2, – 1) and (0, – 1).

Q165 Prove that the points (a, $b + c$), (b, $c + a$) and (c, $a + b$) are collinear.

Q166 For what value of x will the points (x, – 1), (2, 1) and (4, 5) lie on a line?

Q167 If P (x, y) is any point on the line joining the points A (a, 0) and B (0, b), then show that $\frac{x}{a} + \frac{y}{b} = 1$.

Q168 If the points (p, q), (m, n) and ($p - m$, $q - n$) are collinear, show that $pn = qm$.

Q169. If P and Q are two points whose coordinates are $(at^2, 2at)$ and $\left(\frac{a}{t^2}, \frac{2a}{t}\right)$ respectively and S is the point $(a, 0)$. Show that $\frac{1}{SP} + \frac{1}{SQ}$ is independent of t.

Q170. If two vertices of an equilateral triangle be (0, 0), (3, $\sqrt{3}$), find the third vertex.

Q171. If the coordinates of the mid-points of the sides of a triangle are (1, 1), (2, –3) and (3, 4), find the vertices of the triangle.

Q172. If the coordinates of the mid-points of the sides of a triangle are (1, 2), (0, – 1) and (2, – 1). Find the coordinates of its vertices.

Q173. Two opposite vertices of a square are (–1, 2) and (3, 2). Find the coordinates of other two vertices.

Q174. If two opposite vertices of a square are (5, 4) and (1, – 6), find the coordinates of its remaining two vertices.

Q175. Let the opposite angular points of a square be (3, 4) and (1, –1). Find the coordinates of the remaining angular points.

Q176. If (–2, 3), (4, –3) and (4, 5) are the mid-points of the sides of a triangke, find the coordinates of its centroid.

Q177. If the coordinates of two points A and B are (3, 4) and (5, – 2) respectively. Find the coordinates of any point, P if $PA = PB$ and Area of $\Delta PAB = 10$.

Q178. Prove that the coordinates of the centroid of the triangle whose vertices are (x_1, y_1), (x_2, y_2) and (x_3, y_3) are $\left(\frac{x_1 + x_2 + x_3}{3}, \frac{y_1 + y_2 + y_3}{3}\right)$. Also, deduce that the medians of atriangle are concurrent.

Q179. If the coordinates of the mid-points of the sides of a triangle aree (3, 4), (4, 6) and (5, 7), find its vertices.

Q180. If the coordinates of the mid-points of the sides of a triangle are (1, 1), (2, – 3) and (3, 4). Find its centroid.

Q181. Three vertices of a parallelogram $ABCD$ are A (3, – 4), B (– 1, – 3) and C (– 6, 2). Find the coordinates of vertex D and find the area of parallellogram $ABCD$.

Q182. If P (1, 2), Q (1, 0) and R (0, 1) are the mid-points of the sides AB, BC and AC respectively of ΔABC, find the coordinates of the vertices A, B and C, and hence find the area of ΔABC.

Q183. If the points A (1, 2), B (2, 3), C (– 3, 2) and D (– 4, – 3) are the vertices of parallelogram $ABCD$, then taking AB as the base, find the height of the parallelogram.

Date: 29/9/2021

S1. (i) 13 (ii) $RS = 2\sqrt{a^2 + b^2}$. (iii) $AB = a(t_2 - t_1)\sqrt{(t_2 + t_1)^2 + 4}$.

S2. (i) 13 (ii) $2\sqrt{2}\,b$ (iii) $\sqrt{a^2 + b^2}\,(\sin\alpha + \cos\alpha)$ (iv) $\sqrt{a^2 + b^2}$

S3. 10.

S4. 5.

S5. (3, –5), (–3, 5).

S6. (0, 21/5).

S7. $\left(\frac{19}{7}, \frac{22}{7}\right)$.

S8. Area of the triangle = 25 sq. units.

S9. Area of the triangle = 2 sq. units.

S10. $\left(\frac{16}{3}, 6\right)$.

S11. Value of $k = 8$.

S12. The coordinates of the third vertex are (10, –2).

S13. (–4, –7).

S14. **(b)** $\sqrt{2}$.

S15. **(a)** a.

S16. **(a)** ± 4.

S17. **(d)** $\sqrt{a^2 + b^2}$.

S18. **(c)** 9.

S19. **(d)** $2 + \sqrt{2}$.

S20. **(d)** None of these.

S21. **(b)** $-\frac{1}{3}$.

S22. **(d)** None of these.

S23. **(c)** $a = -2,\ b = 6$.

S24. **(c)** 2, – 4.

S25. **(c)** -63.

S26. **(a)** $\frac{2}{3}$.

S27. **(b)** $\frac{4}{3}$.

S28. **(a)** 1.

S29. **(a)** $2:1$.

S30. **(d)** $3\,abc$.

S31. **(b)** 7.

S32. **(d)** $(5, 2)$.

S33. **(b)** 7.

S34. **(a)** 4.

S35. **(b)** ± 3.

S36. **(c)** 6.

S37. **(c)** 2.

S38. **(a)** $3x + 8y = 0$.

S39. **(b)** $a = \frac{7}{3}, \quad b = 0$.

S40. **(a)** $(-6, 7)$.

S41. **(b)** $(3, 5)$.

S42. **(c)** 7.5.

S43. **(b)** $(2, 0)$.

S44. **(b)** $\sqrt{10}$ units.

S45. **(d)** 12.

S46. **(a)** -63.

S47. **(a)** 7.

S48. The coordinates of C and C are $(0, \sqrt{3}a)$ and $(0, -\sqrt{3}a)$ respectively.

S49. Coordinates of O are $(0, 0)$ an that of A are $(2a, 0)$. Since $OL = a$ and $LB = \sqrt{3}a$. So, the coordinates of B are $(a, \sqrt{3}a)$.

S50. Proved.

S51. (i) $\left(\frac{5}{3}, 0\right)$ (ii) $(0, 5)$.

S52. $x = 7$ or -1.

S53. $4, -2$.

S54. Proved.

S55. $3, -9$.

S56. Proved.

S57. Proved.

S58. Proved.

S59. Proved.

S60. $(3, 0)$.

S61. Proved.

S62. $(3, -2)$.

S63. $(0, -1)$.

S64. $(9, 4)$.

S65. $k = 1$.

S66. $\frac{1}{2}ab$.

S67. Value of $x = \pm 4$.

S68. The coordinates of B are $(-5, -2)$.

S69. The point C divides AB in the ratio $2 : 3$.

S70. 10.

S71. $\left(\frac{2}{5}, 0\right)$.

S72. Value of $a + b + c = 0$

S73. Proved. It is not a rectangle.

S74. The fourth vertex of the parallelogram is $(-2, 1)$.

S75. $(-2, -5)$.

S76. Value of $p = 7$.

S77. $\sqrt{10}$ sq. units.

S78. $(1, 1)$.

S79. 5 units.

S80. Length = 6.

S81. Proved.

S82. The coordinates of P are (16, 8).

S83. The required point is (–7, 0).

S84. $x = 2$.

S85. Proved.

S86. Value of $a = 5$.

S87. Proved.

S88. Value of $t = 1$.

S89. Proved.

S90. Proved.

S91. (3, 0).

S92. (i) Proved. (ii) Proved.

S93. (–2, 0).

S94. Proved.

S95. Proved.

S96. Proved.

S97. Proved.

S98. Ratio = 1 : 5.

S99. Value of $m = \frac{-3}{2}$.

S100. Circum-radius = 5.

S101. Area of this triangle = $\frac{25}{2}$ sq. units

S102. $x = 0,\ y = \pm\sqrt{7}$.

S103. $\frac{25}{2}$ sq. units, $5\sqrt{2}$.

S104. $\left(\frac{1+\sqrt{3}}{2}, \frac{7-5\sqrt{3}}{2}\right), \left(\frac{1-\sqrt{3}}{2}, \frac{7+5\sqrt{3}}{2}\right)$.

S105. $\left(2-\frac{\sqrt{11}}{2}, \frac{5}{2}\right), \left(2+\frac{\sqrt{11}}{2}, \frac{5}{2}\right)$.

S106. $(3, -2)$.

S107. $(1, -3)$, $\sqrt{13}$ sq. units.

S108. 45 sq. units.

S109. $(2, -4)$.

S110. $(3, -3)$.

S111. Equation ratio is 1 : 2, Coordinates of the point (3, 0).

S112. Equation ratio is 4 : 3, Coordinates of the point $\left(0, \frac{-13}{7}\right)$.

S113. The ratio is 2 : 1 and value of $p = 2/3$.

S114. Proved. It is not a square.

S115. Proved.

S116. $(1, 2)$.

S117. $(-2, 1)$.

S118. Value of $k = -15$.

S119. 2 : 3 internally.

S120. $(-b, b)$.

S121. $(1, -12)$, $(5, -10)$.

S122. $x = 4$, $y = 2$.

S123. $(3, 2)$.

S124. $a = 4$, $b = 3$.

S125. $(-3, 1.5)$, $(-2, 3)$ $(-1, 4, 5)$.

S126. Proved.

S127. Proved.

S128. Area of the quadrilateral $ABCD = 132$ sq. units.

S129. Proved.

S130. Value of $k = -1$.

S131. If $5x - 4y + 1 = 0$.

S132. Proved.

S133. Value of $k = 3$.

S134. Proved.

S135. Value of $k = 7$.

S136. $\left(\frac{7}{2}, \frac{13}{2}\right)$ or $\left(-\frac{3}{2}, \frac{3}{2}\right)$.

S137. $\frac{11}{8}, \frac{-3}{8}$.

S138. Proved.

S139. Area = $2\sqrt{3}\,a^2$ sq. units.

S140. Area of rectangle = 40 sq. units.

S141. Area of the rhombus = 24 sq. units.

S142. Radius = $\frac{1}{2}\sqrt{130}$ sq. units.

S143. The coordinates of its third vertex are $C(0, 4\sqrt{3})$ and $D(0, -4\sqrt{3})$.

S144. Value of $y = 7$. The radius of the circle = $\sqrt{793}$.

S145. 5, –3.

S146. Value of $p = 1$.

S147. Value of $x = 2$ and Distance of $AP = \sqrt{41}$ units.

S148. $y = 1$, $AQ = \sqrt{41}$ units.

S149. 1/2.

S150. $k = 7$, $p = 3$.

S151. Ratio = 5 : 1.

S152. $\left(\frac{-2}{7}, \frac{-20}{7}\right)$.

S153. $k = 1, 5$.

S154. $p = 1$, $\sqrt{10}$.

S155. $k = -1, -3$; $AP = 3$.

S156. $(3\sqrt{3}, 0)$, $(-3\sqrt{3}, 0)$.

S157. $P(2, 3)$, $Q(3, 4)$ and $R(4, 5)$.

S158. Ratio = 2 : 7; Value of $y = 6$.

S159. Ratio = 3 : 2; Value of $y = 6$.

S160. 3 : 5; (3/2, 0).

S161. Ratio = 3 : 5; Value of $x = 9$.

S162. $x = 4$, $y = 9$ and $p = 5$

S163. Proved.

S164. Area of $\Delta ABC = 12$ sq. units.

S165. Proved.

S166. Value of $x = 1$.

S167. Proved.

S168. Proved.

S169. Proved.

S170. Coordinates of the third vertex are $(0, 2\sqrt{3})$ or $(3, -\sqrt{3})$.

S171. (4, 0), (2, 8), (0, –6).

S172. A (1, –4), B (3, 2) and C (–1, 2).

S173. (1, 0) and (1, 4).

S174. (8, –3) and (–2, 1).

S175. The required vertices of the square are $\left(\frac{9}{2}, \frac{1}{2}\right)$ and $\left(-\frac{1}{2}, \frac{5}{2}\right)$.

S176. $\left(2, \frac{5}{3}\right)$.

S177. The coordinates of P are (7, 2) or (1, 0).

S178. Proved.

S179. (6, 9), (4, 5), (2, 3)

S180. $\left(2, \frac{2}{3}\right)$.

S181. Area of parallellogram $ABCD = 15$ sq. units.

S182. Area of $\Delta ABC = 4$ sq. units.

S183. Height of the parallelogram = $\frac{24}{\sqrt{26}}$ sq. units.