

Class: X
Subject: Mathematics
Topic: Coordinate geometry
No. of Questions: 20
Duration: 60 Min
Maximum Marks: 60

Q1. The area of the triangle is 5 sq. units. Two of its vertices are (2, 1) and (3, -2). The third vertex lies on the line $y = x + 3$, then coordinates of the third vertex is.

- A. $(-\frac{7}{2}, \frac{13}{2})$
- B. $(\frac{7}{2}, \frac{13}{2})$
- C. $(\frac{7}{2}, -\frac{13}{2})$
- D. $(-\frac{7}{2}, -\frac{13}{2})$

Answer: B

Third vertex will be of form $x, x+3$

Solve using area of triangle when 3 vertices are given to get x

Q2. The orthocenter of the triangle formed by the lines $xy = 0$ and $x + y = 1$ is.

- A. (0, 0)
- B. (0, 1)
- C. (1, 0)
- D. (1, 1)

Answer: A

Triangle formed will be right angled triangle at origin. Orthocenter for right triangle is the vertex having right angle which is origin in this case.

Q3 If the points (x, y) , $(1, 2)$ and $(7, 0)$ are collinear, then the relation between 'x' and 'y' is given by

- A. $3x - y - 7 = 0$
- B. $3x + y + 7 = 0$
- C. $x - 3y + 7 = 0$
- D. $x + 3y - 7 = 0$

Answer: D

Area of triangle formed by these 3 points must be 0. Put three points in area of triangle and get the relation.

Q4. The distance between the points $(a \cos 25^\circ, 0)$ and $(0, a \cos 65^\circ)$ is _____.

- A. a
- B. 2a
- C. 3a
- D. 5a

Answer: A

$$\sqrt{(a \cos 25^\circ)^2 + (a \cos 65^\circ)^2} = \sqrt{(a \cos 25^\circ)^2 + (a \sin 25^\circ)^2} = a (\sin(90^\circ - \theta) = \cos \theta)$$

Q5 If D $(3, -1)$, E $(2, 6)$ and F $(-5, 7)$ are the midpoints of the sides of $\triangle ABC$, the area of the triangle is.

- A. 96 sq. units
- B. 24 sq. units
- C. 48 sq. units
- D. 50 sq. units

Answer: A

Area of triangle formed by joining mid-points have 1/4th area of the original triangle Find the area of this triangle by triangle formula. Get the area of triangle ABC by multiplying the obtained area by 4.

Q6 If three points $(0, 0)$, $(3, \sqrt{3})$ and $(3, \lambda)$ form an equilateral triangle, then λ is.

- A. 2
- B. -3
- C. -4
- D. $\sqrt{3}$

Answer: D

Used distance formula and equate sides equal.

Q7. The orthocenter of the triangle formed by O (0,0), A (1, 0), B (0, 1), where orthocenter is the point of intersection of altitudes drawn from vertices on opposite sides is.

- A. $(-\frac{1}{2}, \frac{1}{2})$
- B. $(\frac{1}{3}, \frac{1}{3})$
- C. (0,0)
- D. $(\frac{1}{4}, \frac{1}{4})$

Answer: C This is right angled triangle with $\angle O=90$ that will orthocenter itself.

Q8. The two opposite vertices of a square are (-1, 2) and (3, 2), so the coordinates of the other two vertices are.

- A. (6, 2), (-4, 2)
- B. (0, -2), (2, 4)
- C. (1, 0), (1, 4)
- D. None of these

Answer: C

Draw the following on Cartesian plane and other two points can be located easily corresponding to distance obtained from given 2 points.\

Q9 The coordinate of the third vertex of an equilateral triangle whose two vertices are at (3, 4), (-2, 3) are

- A. (1, 7)
- B. (5, 1).
- C. $(\frac{1+\sqrt{3}}{2}, \frac{7-5\sqrt{3}}{2})$ or $(\frac{1-\sqrt{3}}{2}, \frac{7+5\sqrt{3}}{2})$
- D. (-5, 5)

Answer: C

Length of side of equilateral triangle = $\sqrt{26}$ Let third vertex be (a, b)

Use distance formula to obtain two equations third vertex to other two vertex and solve to get A and B.

Q10. In what ratio is the line segment joining the points (4, 6) and (-7, -1) is divided by X-axis?

- A. 1: 6
- B. 6: 2
- C. 2: 6
- D. 6: 1

Answer: D

Point on x axis (x,0) Let it divide above in ratio k:1 Applying for y coordinate $(-k+6)/k+1 = 0$ $k=6$ Ratio 6:1.

Q11. 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. $\sqrt{a^2 + b^2}$

Answer: D

Simple distance formula and trigonometric simplification.

Q12. Area of quadrilateral formed by the vertices (-1, 6), (-3, -9), (5, -8) and (3, 9) is.

- A. 96 sq. units
- B. 18 sq. units
- C. 50 sq. units
- D. 25 sq. units

Answer: A

Form 2 triads and find area of triangle formed by 2 triads and add them to get area of quadrilateral.

Q13. If the point M (-1, 2) divides the line segment PQ in the ratio 3 : 4, where the co-ordinates of Pare (2, 5), then the coordinates of Q are.

- A. (-5, -2)
- B. (5, 2)
- C. (-5, 2)
- D. (5, -2)

Answer: A

Simple application of section formula

Q14. 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. $3abc$

Answer: D

$$a+b+c=0$$

$$a^3+b^3+c^3=3abc$$

Q15. In what ratio is the line segment joining the points $(-3, 2)$ and $(6, 1)$ is divided by Y-axis?

- A. 1: 3
- B. 2: 1
- C. 1: 2
- D. 3: 1

Answer: C

Point on y-axis $(0, y)$ Let it divide the 2 points in ratio $k:1$ Applying for x coordinate $(6k-3)/(k+1) = 0$ $k=2$

Q16 A $(-1, 2)$, B $(4, 1)$ and C $(7, 6)$ are three vertices of the parallelogram ABCD. The coordinates of fourth vertex is _____.

- A. $(7, -2)$
- B. $(-2, 7)$
- C. $(7, 2)$
- D. $(2, 7)$

Answer: D

Let Coordinates of D be (x, y) As diagonals of ||gm bisects, find intersection point from AC Now using mid-point formula find coordinates from BD as well Both should be same. Obtain x and y.

Q17. If A (2, 2), B (-4, -4) and C (5, -8) are the vertices of a triangle, then the length of the median through vertex C is _____.

- A. $\sqrt{65}$ units
- B. $\sqrt{117}$ units
- C. $\sqrt{85}$ units
- D. $\sqrt{113}$ units

Answer: C

Find mid-point of AB i.e. (-1,-1) say D Using distance formulas find the length of median CD.

Q18. A circle has its center at the origin and a point P (5, 0) lies on it. Then the point Q (8, 6) lies _____ the circle.

- A. Cannot be determined
- B. on
- C. outside
- D. inside

Answer: C

Find the radius of circle which comes out to be 5 From center distance of (8,6) will be 10 units which is greater than radius. Hence the point lies outside the circle.

Q19. If A (5, 3), B (11, -5) and P (12, y) are the vertices of a right angled triangle, right angled at P, then y is _____.

- A. -2, 4
- B. -2, -4
- C. 2, -4
- D. 2, 4

Answer: C

Using distance formulas find all sides then apply Pythagoras theorem to solve.

Q20. If the point P (2, 4) lies on a circle, whose center is C (5, 8), then the radius of the circle is

- A. 8 units
- B. 5 units
- C. 4 units
- D. 25 units

Answer: B

Simple Distance Formula Application

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