Coordinate Geometry

Standard difficulty · 20 questions · 40 marks · Time: 36 minutes

Name: _____ Date: _____ Score: ____ / 40

Show your working for Sections B and C. Answers are on the last page — try every question first!

Section A — Choose the correct answer — 8 × 1 = 8 marks

1. The distance between (−5, 2) and (2, 26) is:

(a) 25 units **(b)** 26 units **(c)** 625 units **(d)** 31 units

2. The distance of (12, 16) from the origin is:

(a) 20 units **(b)** 28 units **(c)** 400 units **(d)** 4 units

3. The midpoint of (−1, −8) and (5, −18) is:

(a) (4, −26) **(b)** (−13, 2) **(c)** (6, −10) **(d)** (2, −13)

4. The point dividing the join of (−8, 7) and (0, 3) internally in the ratio 3 : 1 is:

(a) (−2, 4) **(b)** (−1, 4) **(c)** (−2, 5) **(d)** (−6, 6)

5. The distance between (x_1, y_1) and (x_2, y_2) is:

(a) $\sqrt{((x_2 - x_1)^2 + (y_2 - y_1)^2)}$ **(b)** $(x_2 - x_1)^2 + (y_2 - y_1)^2$

(c) $(x_2 - x_1) + (y_2 - y_1)$ **(d)** $\sqrt{((x_2 + x_1)^2 + (y_2 + y_1)^2)}$

6. The midpoint of (8, −6) and (x, −6) is (2, −6). Then x equals:

(a) −4 **(b)** 10 **(c)** −6 **(d)** 14

7. The point on the x-axis equidistant from (2, 8) and (−10, 8) is:

(a) (−4, 0) **(b)** (−5, 0) **(c)** (0, −4) **(d)** (−3, 0)

8. Assertion (A): The distance between (−6, 4) and (1, −20) is 24 units.
Reason (R): The distance between (x_1, y_1) and (x_2, y_2) is $\sqrt{((x_2 - x_1)^2 + (y_2 - y_1)^2)}$.

(a) Both A and R are true, and R is the correct explanation of A.

(b) Both A and R are true, but R is not the correct explanation of A.

(c) A is true, but R is false.

(d) A is false, but R is true.

Section B — Short answer — 8 × 2 = 16 marks

9. Find the distance between (4, 8) and (12, 23).

10. Find the point that divides the join of (8, −8) and (15, −22) internally in the ratio 3 : 4.

11. In what ratio does (−1, −1) divide the join of (−7, 8) and (1, −4)?

12. In what ratio does the x-axis divide the join of (7, −12) and (−4, 10)? Find the point of division.

13. The midpoint of AB is (−5, 6) and A is (7, −1). Find B.

14. Find the perimeter of the triangle with vertices (7, 0), (16, 0) and (7, 12).

15. Find the points of trisection of the segment joining (4, 1) and (16, 13).

16. Find y if the distance between (7, 4) and (15, y) is 10 units.

Section C — Word problems — 4 × 4 = 16 marks

17. On a map with 1 unit = 1 km, Lakhanpur is at (−4, 6) and Devgarh is at (−16, 22). How far apart are they?

18. A straight path runs from a gate at (4, 6) to a fountain at (12, 14). A tree is planted on the path, dividing it in the ratio 3 : 1 from the gate. Where is the tree?

19. Ananya lives at (−7, 1) and Isha at (−9, 3). They agree to meet exactly halfway. Where do they meet?

20. Show that A(−5, 6), B(1, 12), C(−5, 18) and D(−11, 12) form a square, and find its area.

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Answer key

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Q	Answer	Working
1	**(a) 25 units**	$\sqrt{(49 + 576)} = \sqrt{625} = 25$
2	**(a) 20 units**	$\sqrt{(144 + 256)} = 20$
3	**(d) (2, −13)**	$((-1 + 5)/2, (-8 + (-18))/2)$
4	**(a) (−2, 4)**	$((3 \times 0 + 1 \times (-8))/4, (3 \times 3 + 1 \times 7)/4)$
5	**(a) $\sqrt{((x_2 - x_1)^2 + (y_2 - y_1)^2)}$**	—
6	**(a) −4**	$(8 + x)/2 = 2$, so $x = -4$
7	**(a) (−4, 0)**	$(x - 2)^2 + 64 = (x - (-10))^2 + 64$ gives $x = -4$; both distances are $\sqrt{100}$
8	**(d) A is false, but R is true.**	A is false: $\sqrt{(49 + 576)} = 25$, not 24. R is true.
9	**17 units**	$\sqrt{((12 - 4)^2 + (23 - 8)^2)} = \sqrt{289} = 17$
10	**(11, −14)**	$((3 \times 15 + 4 \times 8)/7, (3 \times (-22) + 4 \times (-8))/7)$
11	**3 : 1**	put the ratio as r : 1 in the section formula for x: $r = 3$
12	**6 : 5; (1, 0)**	on the x-axis $y = 0$: $(r \times 10 + (-12))/(r + 1) = 0$, $r = 6/5$
13	**(−17, 13)**	$B = (2 \times (-5) - 7, 2 \times 6 - (-1))$
14	**36 units**	sides 9, 12 and $\sqrt{(9^2 + 12^2)} = 15$
15	**(8, 5) and (12, 9)**	ratios 1 : 2 and 2 : 1
16	**y = 10 or y = −2**	$(8)^2 + (y - 4)^2 = 100$, so $y - 4 = \pm 6$
17	**20 km**	$\sqrt{(144 + 256)} = 20$
18	**(10, 12)**	section formula with 3 : 1
19	**(−8, 2)**	midpoint $((-7 + (-9))/2, (1 + 3)/2)$
20	**all sides $6\sqrt{2}$, both diagonals 12; area 72 square units**	$AB^2 = 6^2 + 6^2 = 72$ for every side; equal diagonals make it a square

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