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Coordinates: Chapter Introduction

1. Two numbers fix a place

"Row 3, seat 5" locates one seat exactly. In the same way two perpendicular number lines, the **x-axis** (horizontal) and the **y-axis** (vertical), meeting at the **origin O (0, 0)**, let us locate any point by an ordered pair **(x, y)**.

2. Plotting (x, y)

Start at O; move x units along the x-axis (right if positive, left if negative); then y units parallel to the y-axis (up if positive, down if negative). (3, 2): 3 right, 2 up. Order matters: (3, 2) ≠ (2, 3).

3. Quadrants

Quadrant	Signs	Example
I	(+, +)	(3, 2)
II	(−, +)	(−2, 4)
III	(−, −)	(−1, −3)
IV	(+, −)	(5, −2)

Points on an axis are in no quadrant: on the x-axis y = 0, on the y-axis x = 0.

4. Distance without a ruler

(1, 1) to (4, 5): horizontal 4 − 1 = 3, vertical 5 − 1 = 4, so distance = $\sqrt{(3^2 + 4^2)}$ = **5** (Pythagoras).

Practice questions

1. (MCQ) (−4, 3) lies in quadrant (a) I (b) II (c) III (d) IV
2. (Very short) Where does (0, −3) lie?
3. (Short) How do you plot (−3, 2)?
4. (Numerical) Find the distance between (0, 0) and (6, 8).
5. (Numerical) Find the distance between (−2, 0) and (4, 0).

Answer key

1. (b).
2. On the y-axis.
3. 3 units left from O, then 2 up; quadrant II.
4. $\sqrt{(36 + 64)} = 10$.
5. 4 − (−2) = 6.

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