Guide to: Coordinates

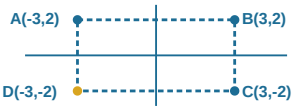
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Explanation:

Coordinates are always written as (x, y) — go **along the corridor (*x*-axis, horizontal)** first, then **up or down the stairs (*y*-axis, vertical)**. In all four quadrants, left of the origin (0, 0) gives a negative x-coordinate and below the origin gives a negative y-coordinate.

To find the **midpoint** of a line segment joining (x_1, y_1) and (x_2, y_2), average the x-coordinates and average the y-coordinates: Midpoint = $(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2})$.

Example 1: $A(-3, 2)$, $B(3, 2)$ and $C(3, -2)$ are three corners of rectangle $ABCD$. Find the coordinates of D.



D lines up vertically with A ($x = -3$) and horizontally with C ($y = -2$). **Answer: (−3, −2)**

Example 2: Find the coordinates of the midpoint M of the line joining $P(-4, 7)$ and $Q(6, -1)$.

Solution:

Average the x-coordinates and the y-coordinates:

- $x_M = \frac{-4 + 6}{2} = \frac{2}{2} = \mathbf{1}$
- $y_M = \frac{7 + (-1)}{2} = \frac{6}{2} = \mathbf{3}$

Answer: (1, 3)

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