Marking guide | Coordinates and three-dimensional space

Year 8 Coordinates and three-dimensional space - topic test

15 questions | 28 marks | 45 minutes

Work from short skills to connected reasoning and practical applications. Show enough working to explain each answer.

Equivalent correct methods earn the corresponding marks.

1. Write the x- and y-coordinates of $A(-2, 3)$. [1 mark]

Read the first then second entries.

Answer: $x = -2,\ y = 3.$

2. Translate $(1, -2)$ three units left and four units up. [2 marks]

$1 - 3 = -2;\ -2 + 4 = 2.$

Answer: $(-2, 2)$

3. Reflect $(-3, 1)$ in the y-axis. [2 marks]

Change x to its opposite.

Answer: $(3, 1)$

4. Rotate $(2, -1)$ 90° anticlockwise about the origin. [2 marks]

Use $(x, y) \to (-y, x)$.

Answer: $(1, 2)$

5. A crate is 4 units across, 3 units in depth and 2 units high. Write (x, y, z). [1 mark]

Use across, depth, height order.

Answer: $(4, 3, 2)$

6. Which point lies on the xy-plane: $A(2, 0, 3)$, $B(3, 1, 0)$ or $C(0, 2, 1)$? Explain. [2 marks]

The xy-plane has height zero.

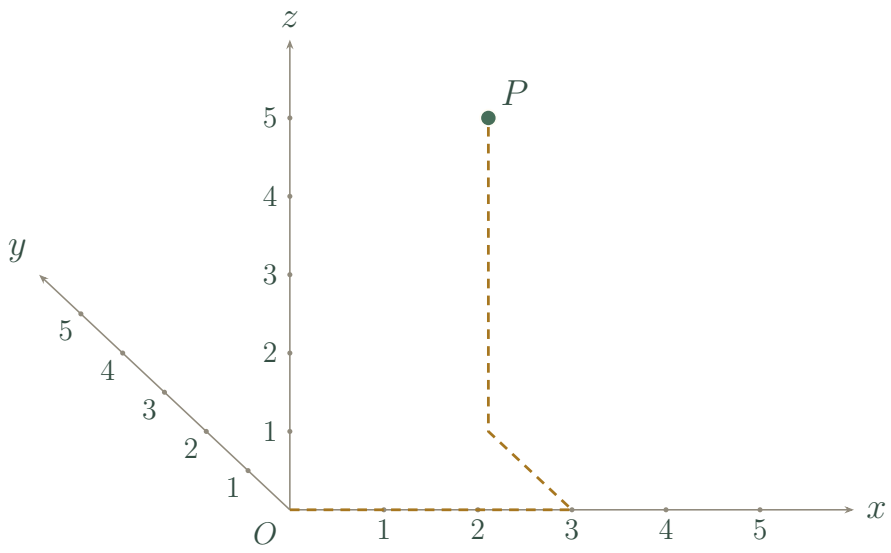
Answer: B, because its z-coordinate is zero.

7. Which axis contains $(0, 4, 0)$? [1 mark]

Only the y-entry is non-zero.

Answer: The y-axis.

8. State P's coordinates from the labelled 3D diagram. [2 marks]



Read the dashed construction in x, y, z order.

Answer: $(3, 2, 4)$

9. From $(2, 3, 1)$, move parallel to z until the height is 5. Give the endpoint. [2 marks]

Only z changes.

Answer: $(2, 3, 5)$

10. Start at $(1,1,0)$. Move 3 units in positive x, 2 in positive z and 1 in negative y. Give endpoint and route length. [3 marks]

$(1,1,0) \to (4,1,0) \to (4,1,2) \to (4,0,2)$.

$3+2+1=6$.

Answer: $(4,0,2)$; 6 units.

11. A robot moves from $(2,2,1)$ to $(5,1,3)$, changing one coordinate at a time without reversing. Find the route length. [2 marks]

Changes have lengths 3,1,2.

$3+1+2=6$.

Answer: 6 units.

12. A camera's front view shows x,z. Find the front view of $(4,2,3)$. [1 mark]

The y-coordinate is hidden.

Answer: $(4,3)$

13. A point has front view $(3,5)$ on x,z and top view $(3,2)$ on x,y. Find its triple. [2 marks]

Combine $x=3$, $z=5$ with $y=2$.

Answer: $(3,2,5)$

14. $A(2,1,4)$ and $B(2,3,4)$ look like one point in the front view on x,z. Explain why that does not mean $A=B$. [2 marks]

Both project to $(2,4)$, but $1 \neq 3$ in the y-coordinate.

Answer: The view hides y; A and B have different depths.

15. A delivery robot starts at $(1,2,0)$, moves 4 units in positive x, 3 units in positive z, then returns along exactly the same route. State its final position and total distance. [3 marks]

$\text{Outward distance} = 4+3=7$.

Returning adds another 7, so $\text{total}=14$.

The robot reaches its starting position.

Answer: $(1,2,0)$; 14 units.