Plot India's Outline on Square Graph Paper: Coordinate Mapping

Original tasks 1, 2, 3 / complete keys

Task 1

On a square grid, plot these points in order: P(1,1), Q(4,1), R(4,3), S(1,3). Connect them to close the shape, shade the interior, and add a marker at T(2,2). Describe the shape and the marker position.

Answer: The outline is a rectangle three squares wide and two squares tall. The marker T is inside the rectangle, one square right and one square up from P.

Reason: P to Q is a horizontal segment of length three. Q to R is vertical length two. R to S is horizontal length three. S to P is vertical length two. T is at x=2, y=2, which is inside the rectangle.

Check: Count squares between plotted points: width three, height two. Confirm T is one right and one up from P and inside the shaded area.

Task 2

Plot these coastline points in order: A(0,2), B(3,2), C(3,5), D(1,5), E(1,4), F(0,4). Connect A to B to C to D to E to F and back to A. Shade the interior. Add a marker at M(2,3). Is M inside the shaded shape?

Answer: M(2,3) is inside the shaded polygon. The L-like outline has a notch at the upper left of its enclosing rectangle, in the region left of x=1 and above y=4; M lies to the right of that notch.

Reason: The enclosing rectangle is x=0 to x=3 and y=2 to y=5. The missing upper-left corner is x=0 to x=1 and y=4 to y=5. M(2,3) lies in the included lower rectangle, so it is inside.

Check: Plot M and check whether a horizontal line from M to the right crosses the boundary once. It does, so M is inside. Also confirm M is not in the notch.

Task 3

A simplified outline uses points: (2,0), (6,0), (6,2), (4,2), (4,4), (2,4). Plot and connect them in order, closing the shape. Shade the interior. Add markers at X(3,1) and Y(5,3). State whether each marker is inside or outside.

Answer: X(3,1) is inside. Y(5,3) is outside because the shape does not extend above y=2 for x=5.

Reason: The polygon covers a lower rectangle from x=2 to x=6 and y=0 to y=2, plus an upper rectangle from x=2 to x=4 and y=2 to y=4. X is in the lower rectangle. Y at x=5, y=3 is above the lower rectangle and to the right of the upper rectangle, so it is outside.

Check: Plot both markers. For Y, check that no shaded region exists at x=5 above y=2. For X, confirm it lies within the lower rectangle bounds.

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Original tasks 4 / complete keys

Task 4

Plot points A(1,1), B(5,1), C(5,4), D(3,6), E(1,4). Connect A to B to C to D to E and back to A. Shade the interior. Add a marker at M(3,3). Describe the shape and check whether M is inside.

Answer: The shape is a pentagon with a flat base, vertical right side, and a peak at D. M(3,3) is inside.

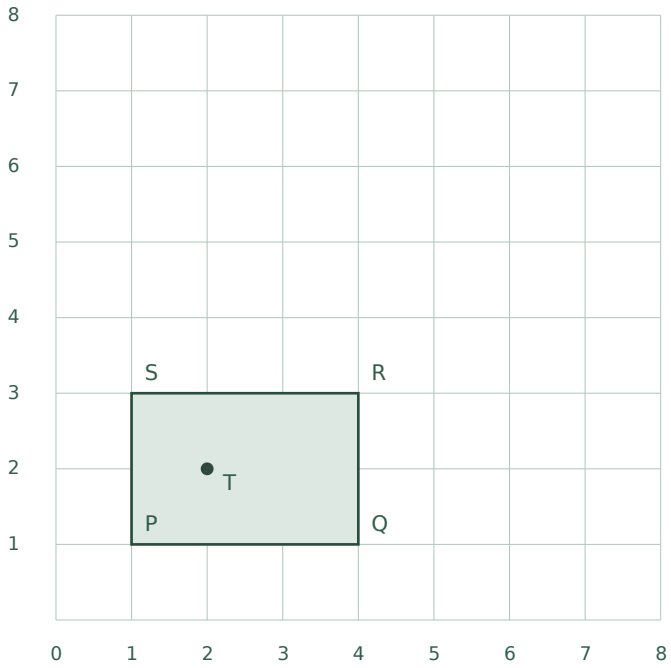
Reason: The base runs from x=1 to x=5 at y=1. The right side rises to y=4. The top edges slope to the peak at (3,6) and back down to (1,4). M at (3,3) is above the base and below the peak, within the horizontal span, so it is inside.

Check: Draw a horizontal line through M. It crosses the left and right boundaries once each, so M is inside. Confirm the peak is at x=3 and the base spans x=1 to x=5.

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Task 1 / answers

TOY coordinate polygons / not India borders / one grid unit = chosen 10 mm

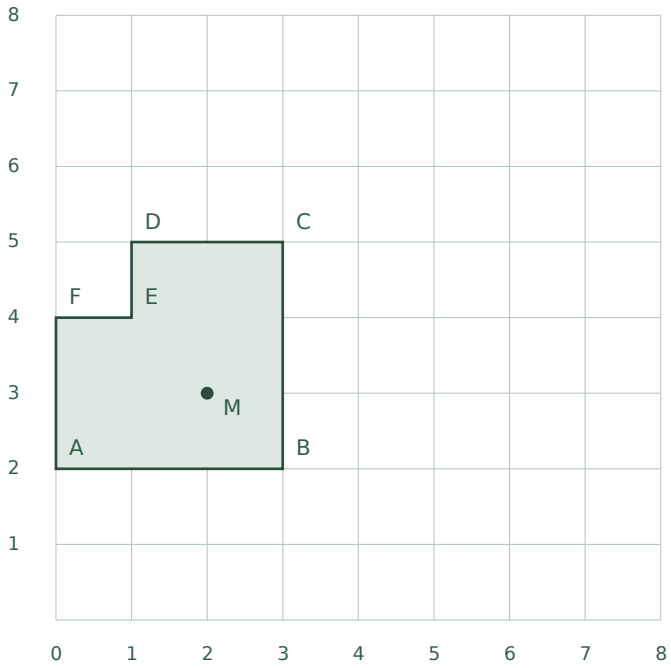


Program plots the literal source order, closes and shades only the polygon interior. Markers are separate from the connected boundary.

Plot India's Outline on Square Graph Paper: Coordinate Mapping

Task 2 / answers

TOY coordinate polygons / not India borders / one grid unit = chosen 10 mm

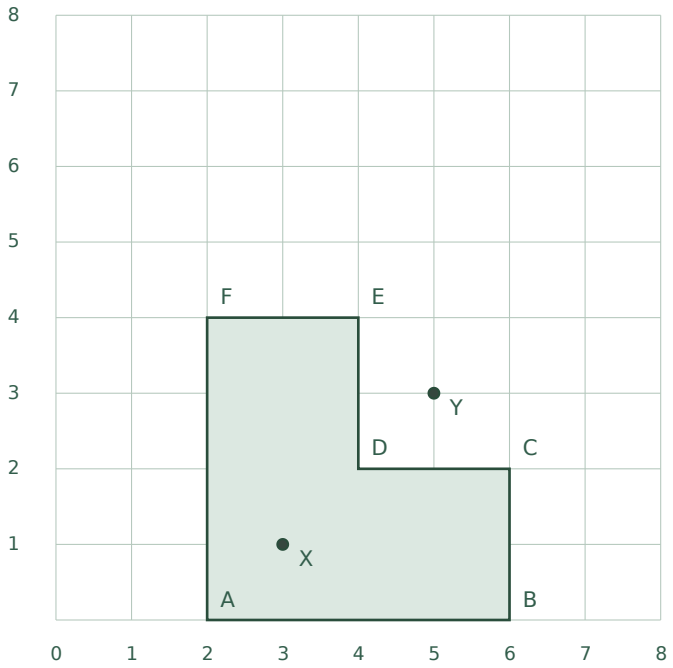


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Plot India's Outline on Square Graph Paper: Coordinate Mapping

Task 3 / answers

TOY coordinate polygons / not India borders / one grid unit = chosen 10 mm

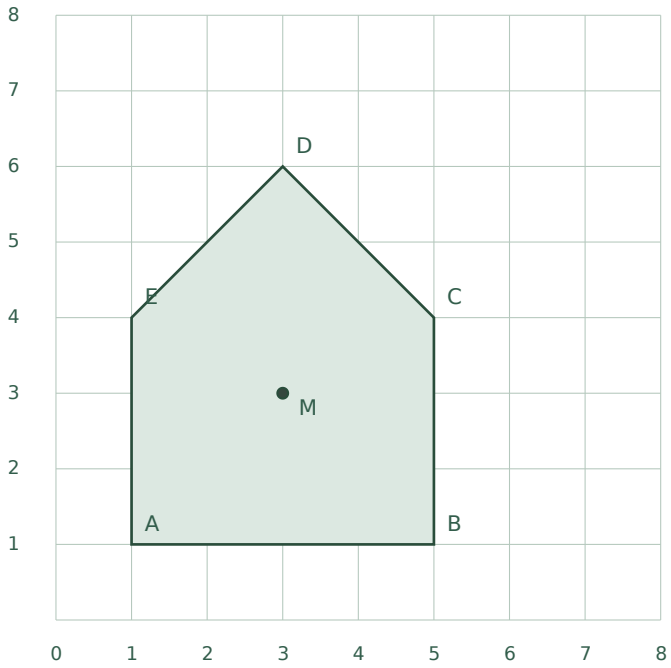


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Plot India's Outline on Square Graph Paper: Coordinate Mapping

Task 4 / answers

TOY coordinate polygons / not India borders / one grid unit = chosen 10 mm



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Plot India's Outline on Square Graph Paper: Coordinate Mapping

Source rubric / reflection

- [ ] All listed points are plotted and labeled.
- [ ] Points are connected in the given order with straight segments.
- [ ] The outline is closed if the coordinate list is closed.
- [ ] The interior is shaded lightly and stays inside the boundary.
- [ ] Three landmark markers are plotted at the given coordinates and labeled.
- [ ] Plotting follows a stated convention, such as nearest half-square, consistently.
- [ ] Labels are legible; valid alternative letter styles are accepted.
- [ ] Work is neat enough to check without ambiguity.

Reflection: What did you check, what did you change, and what will you try next?