Graph Equations by Plotting Points: A Table-and-Grid Method

Rubric key

Rubric: correct table values; correct plotting; correct graph type; verification check; equation and scale note.

Table includes at least three correct ordered pairs for the given equation.

Points are plotted in the correct quadrants with x before y.

Graph type matches the equation: straight line for linear, smooth curve for nonlinear.

At least one verification point is checked and shown.

Graph is labeled with the equation and a scale note if needed.

Graph Equations by Plotting Points: A Table-and-Grid Method

Complete worked example / separate answer key

Graph the equation y = 2x + 1 by plotting points. Use x values -1, 0, 1, and 2. Show the table, the plotted points, and a verification check.

Answer: Table: x = -1 gives y = -1; x = 0 gives y = 1; x = 1 gives y = 3; x = 2 gives y = 5. Ordered pairs: (-1, -1), (0, 1), (1, 3), (2, 5). Plot these on a grid with each square as one unit. The points lie on a straight line, so use a ruler to connect them and extend the line. Verification: the graph appears to pass through (3, 7). Substitute x = 3: y = 2(3) + 1 = 7, which matches. The graph is correct.

Graph Equations by Plotting Points: A Table-and-Grid Method

Original tasks 1, 2, 3 / complete keys

Task 1

Graph y = x + 2 by plotting points. Use x = -2, -1, 0, 1, 2. Describe the table and the graph.

Answer: Table: (-2, 0), (-1, 1), (0, 2), (1, 3), (2, 4). The points lie on a straight line with slope 1 and y-intercept 2. Connect with a ruler and extend.

Reason: Substitute each x into y = x + 2. The constant difference in y for each step in x confirms a linear graph.

Check: Pick (3, 5) on the extended line: 3 + 2 = 5, so the point satisfies the equation.

Task 2

Graph y = x^2 - 1 by plotting points. Use x = -2, -1, 0, 1, 2. Describe the shape and the vertex.

Answer: Table: (-2, 3), (-1, 0), (0, -1), (1, 0), (2, 3). The graph is a U-shaped curve opening upward with vertex at (0, -1). Connect with a smooth curve.

Reason: Squaring negative and positive values gives the same y, so the graph is symmetric about the y-axis. The lowest point is at x = 0.

Check: Check (1.5, 1.25): 1.5^2 - 1 = 2.25 - 1 = 1.25, which lies on the curve between plotted points.

Task 3

Graph y = -2x + 3 by plotting points. Use x = -1, 0, 1, 2. Describe the line and its direction.

Answer: Table: (-1, 5), (0, 3), (1, 1), (2, -1). The points form a straight line that falls from left to right because the coefficient of x is negative.

Reason: Each increase of 1 in x decreases y by 2, giving a constant downward pattern. The y-intercept is 3.

Check: Check (3, -3): -2(3) + 3 = -3, which matches the extended line.

Graph Equations by Plotting Points: A Table-and-Grid Method

Original tasks 4 / complete keys

Task 4

Graph y = 0.5x^2 + 1 by plotting points. Use x = -2, -1, 0, 1, 2. Describe the curve and a verification point.

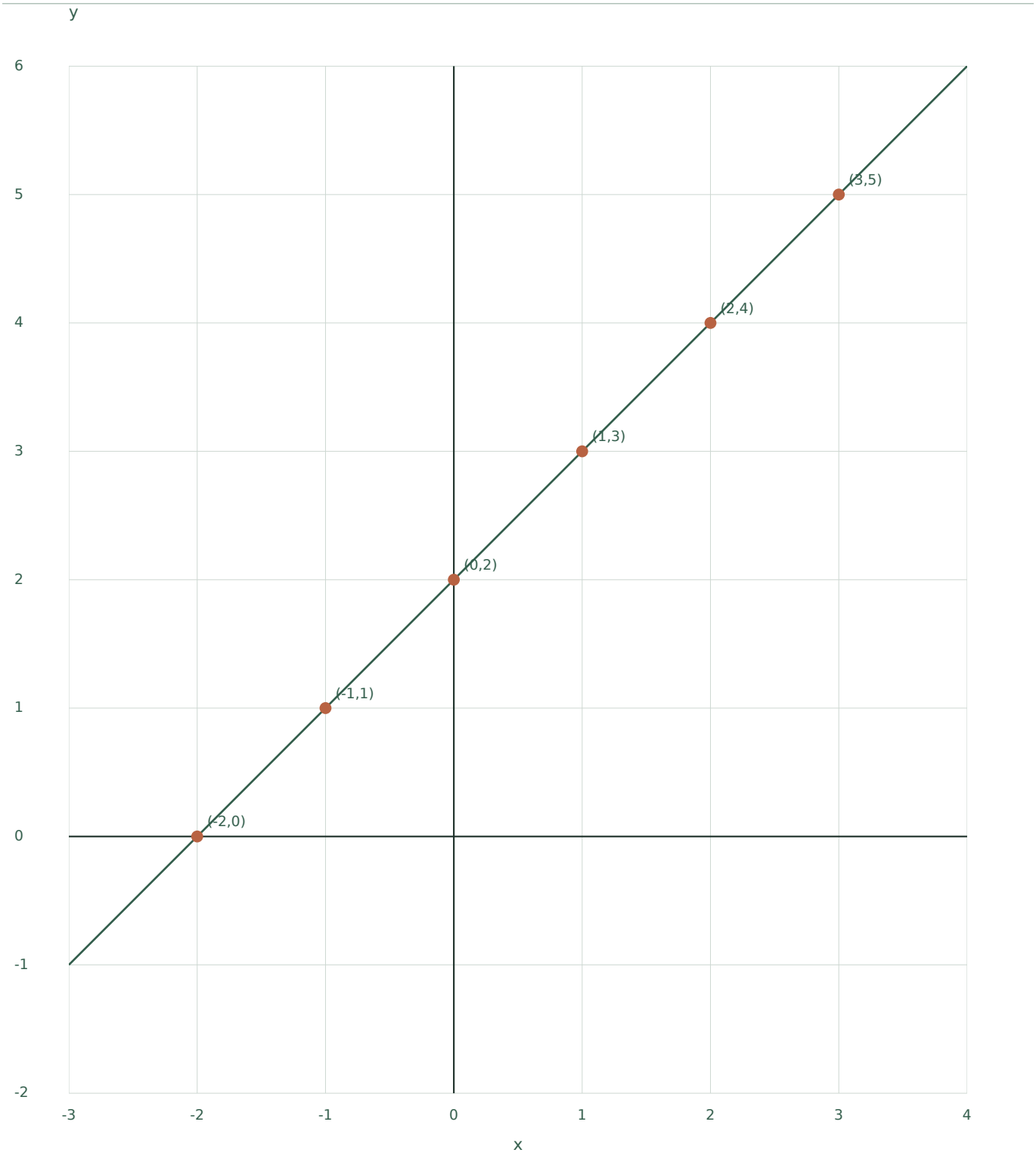
Answer: Table: (-2, 3), (-1, 1.5), (0, 1), (1, 1.5), (2, 3). The graph is a wide U-shaped curve opening upward with vertex at (0, 1).

Reason: The coefficient 0.5 makes the curve wider than y = x^2. Symmetry about the y-axis holds because x is squared.

Check: Check (3, 5.5): 0.5(9) + 1 = 4.5 + 1 = 5.5, which lies on the extended curve.

Graph Equations by Plotting Points: A Table-and-Grid Method

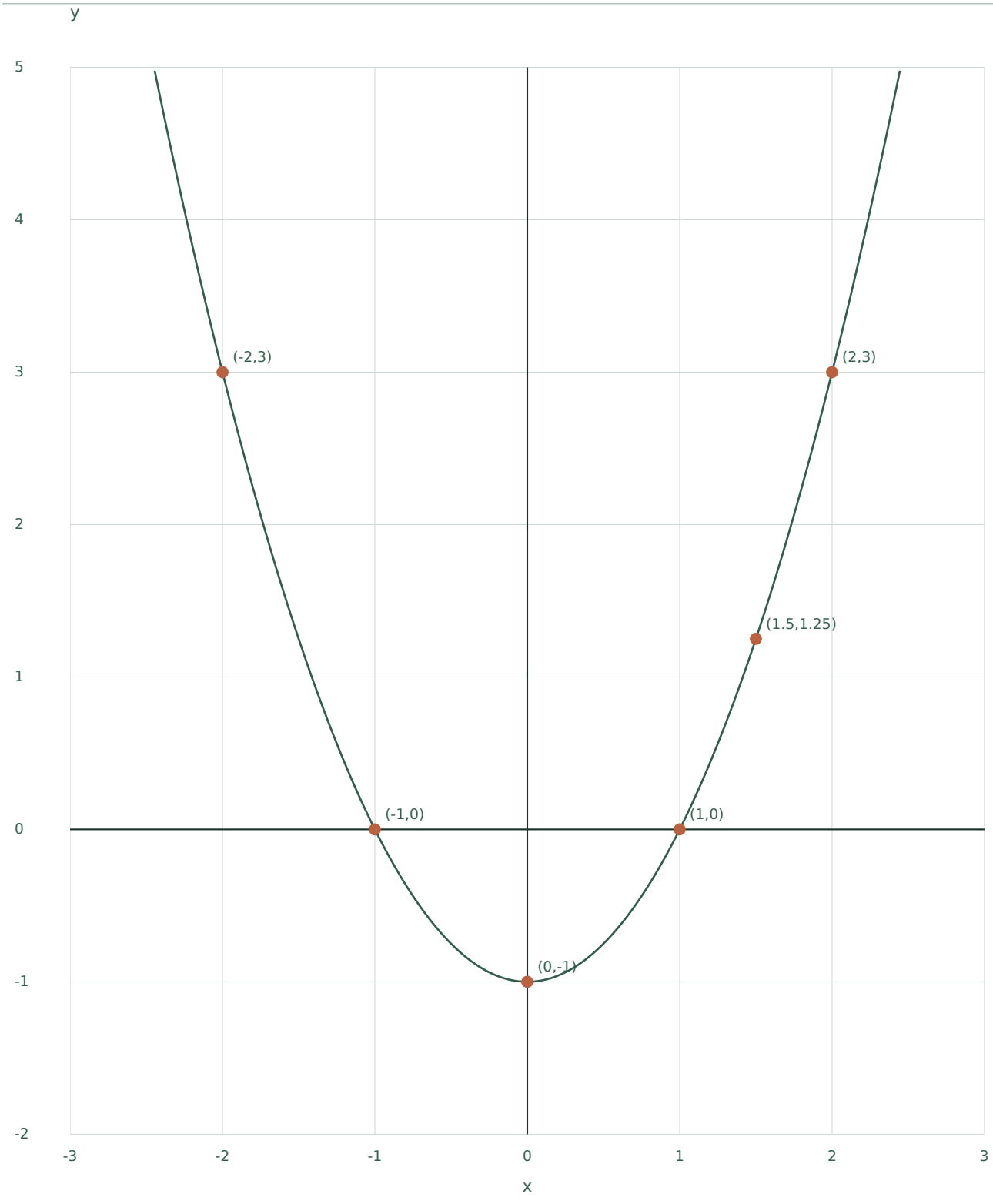
Task 1 / Answer graph for y = x + 2



Straight line; verification point (3,5).

Graph Equations by Plotting Points: A Table-and-Grid Method

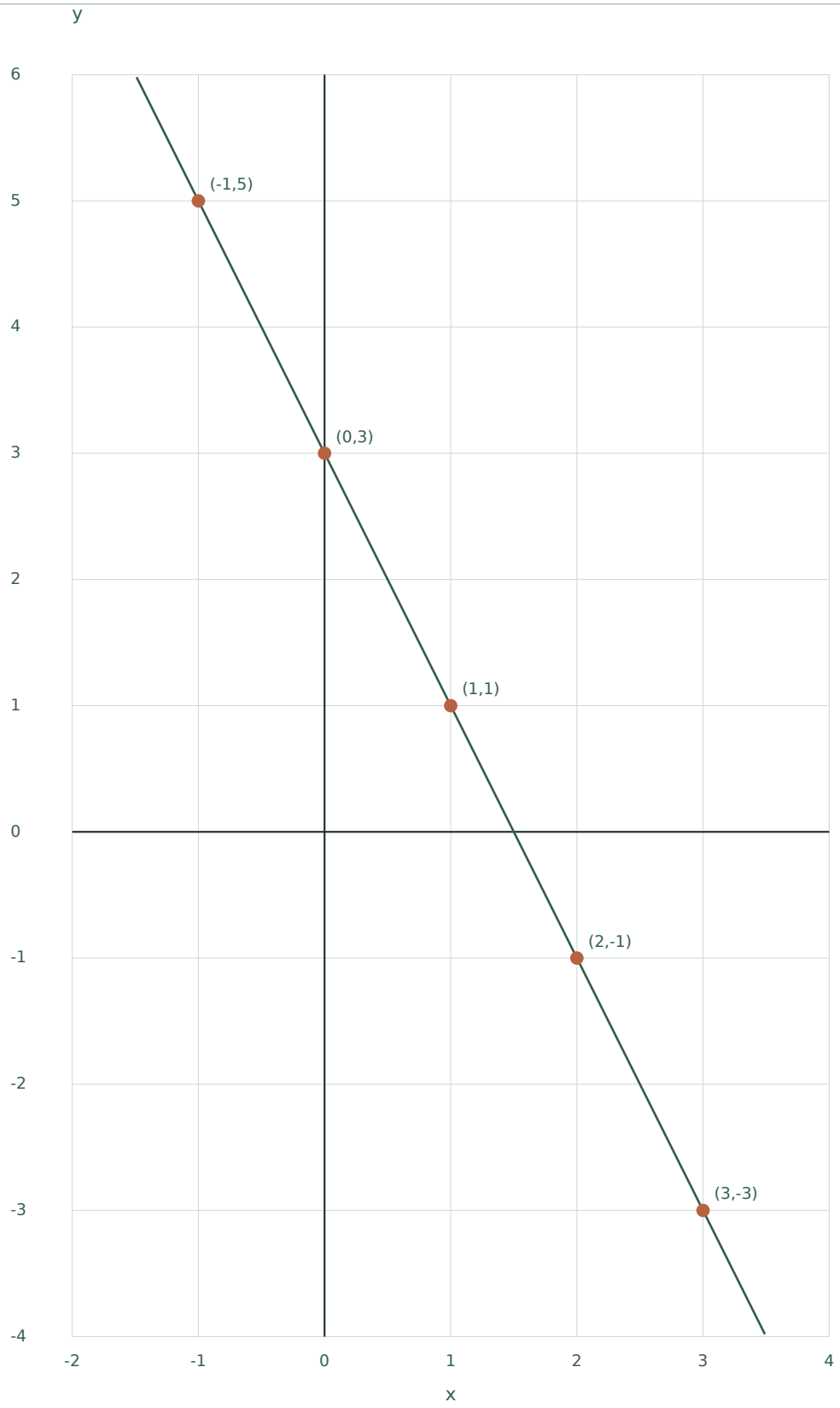
Task 2 / Answer graph for y = x^2 - 1



Smooth curve; verification point (1.5,1.25).

Graph Equations by Plotting Points: A Table-and-Grid Method

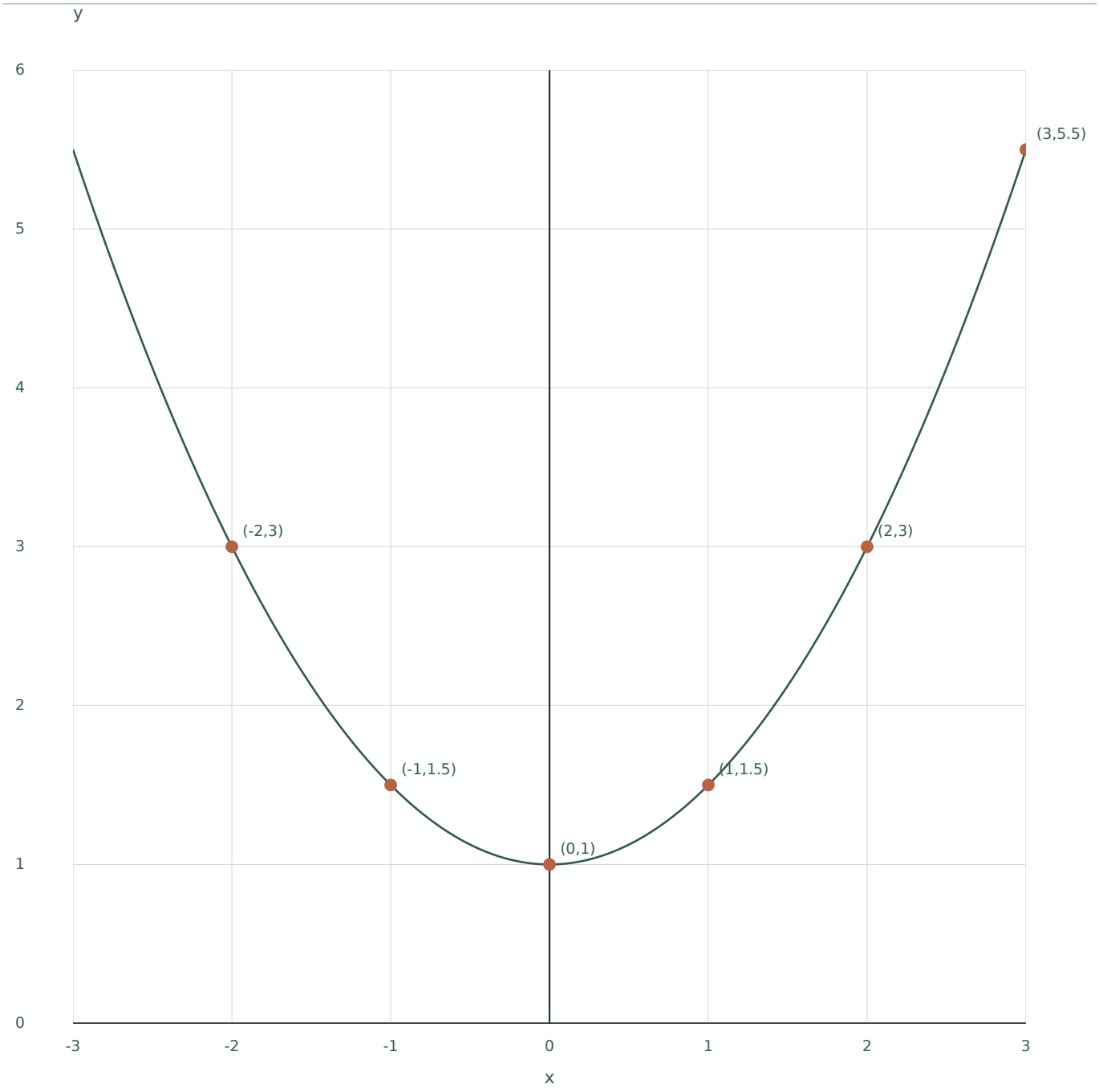
Task 3 / Answer graph for y = -2x + 3



Straight line falling left to right; verification point (3,-3).

Graph Equations by Plotting Points: A Table-and-Grid Method

Task 4 / Answer graph for y = 0.5x^2 + 1



Wide smooth curve; verification point (3,5.5).

Graph Equations by Plotting Points: A Table-and-Grid Method

Task 1 / Answer table for y = x + 2

Table: (-2,0), (-1,1), (0,2), (1,3), (2,4). Straight line with slope 1 and y-intercept 2. Check (3,5).

x	y
-2	0
-1	1
0	2
1	3
2	4

Graph Equations by Plotting Points: A Table-and-Grid Method

Task 2 / Answer table for y = x^2 - 1

Table: (-2,3), (-1,0), (0,-1), (1,0), (2,3). U-shaped curve opening upward; vertex (0,-1). Check (1.5,1.25).

x	y
-2	3
-1	0
0	-1
1	0
2	3

Graph Equations by Plotting Points: A Table-and-Grid Method

Task 3 / Answer table for y = -2x + 3

Table: (-1,5), (0,3), (1,1), (2,-1). Straight line falling left to right; y-intercept 3. Check (3,-3).

x	y
-1	5
0	3
1	1
2	-1

Graph Equations by Plotting Points: A Table-and-Grid Method

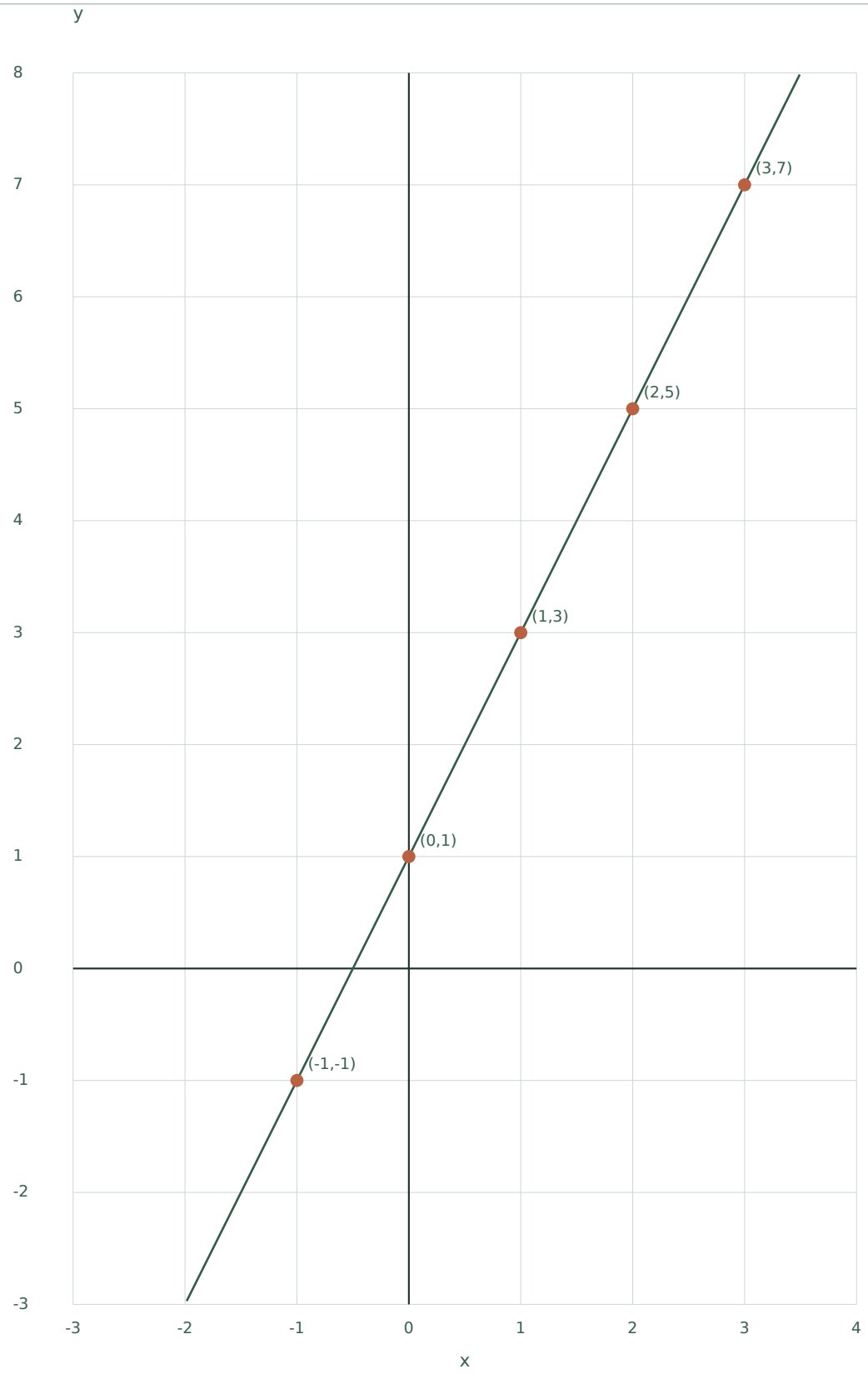
Task 4 / Answer table for y = 0.5x^2 + 1

Table: (-2,3), (-1,1.5), (0,1), (1,1.5), (2,3). Wide U-shaped curve opening upward; vertex (0,1). Check (3,5.5).

x	y
-2	3
-1	1.5
0	1
1	1.5
2	3

Graph Equations by Plotting Points: A Table-and-Grid Method

Worked example / Plotted linear example y = 2x + 1



Straight line through plotted points; verification point (3,7).

Graph Equations by Plotting Points: A Table-and-Grid Method

Source rubric / reflection

- [ ] Table includes at least three correct ordered pairs for the given equation.
- [ ] Points are plotted in the correct quadrants with x before y.
- [ ] Graph type matches the equation: straight line for linear, smooth curve for nonlinear.
- [ ] At least one verification point is checked and shown.
- [ ] Graph is labeled with the equation and a scale note if needed.

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