Identify Proportional Graphs: Straight Lines Through the Origin

Original tasks 1, 2, 3 / complete keys

Task 1

A graph shows a straight line passing through (0,4) and (2,8). Is the relationship proportional? Justify.

Answer: No. The graph is a straight line, but it crosses the y-axis at (0,4), not the origin. The ratio at (2,8) is 8/2 = 4, but the nonzero y-intercept means the ratio is not constant for all points.

Reason: Proportional graphs must be straight lines through (0,0). This line is straight but has y-intercept 4, so it fails the origin test.

Check: Verify the y-intercept by reading where the line crosses the vertical axis. Confirm it is not (0,0).

Task 2

A graph shows a curve passing through (0,0), (1,1), and (2,4). Is the relationship proportional? Justify.

Answer: No. Although the curve passes through the origin, it is not a straight line. The ratios 1/1 = 1 and 4/2 = 2 differ, so the relationship is not proportional.

Reason: Both conditions are required. Passing through the origin is not enough; the graph must also be straight.

Check: Compare y/x at two nonzero x-values. Unequal ratios confirm non-proportionality.

Task 3

A graph shows a straight line passing through (0,0) and (3,6). Is the relationship proportional? Justify.

Answer: Yes. The graph is a straight line and it passes through the origin (0,0). The ratio at (3,6) is 6/3 = 2, consistent with a constant ratio.

Reason: Both conditions hold: straight line and origin passage. This matches the definition of a proportional graph.

Check: Confirm the line is straight and visibly crosses (0,0). Compute y/x at a nonzero point to support the constant ratio.

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Original tasks 4 / complete keys

Task 4

A graph shows only one point at (2,5). Can you judge whether the relationship is proportional? Explain.

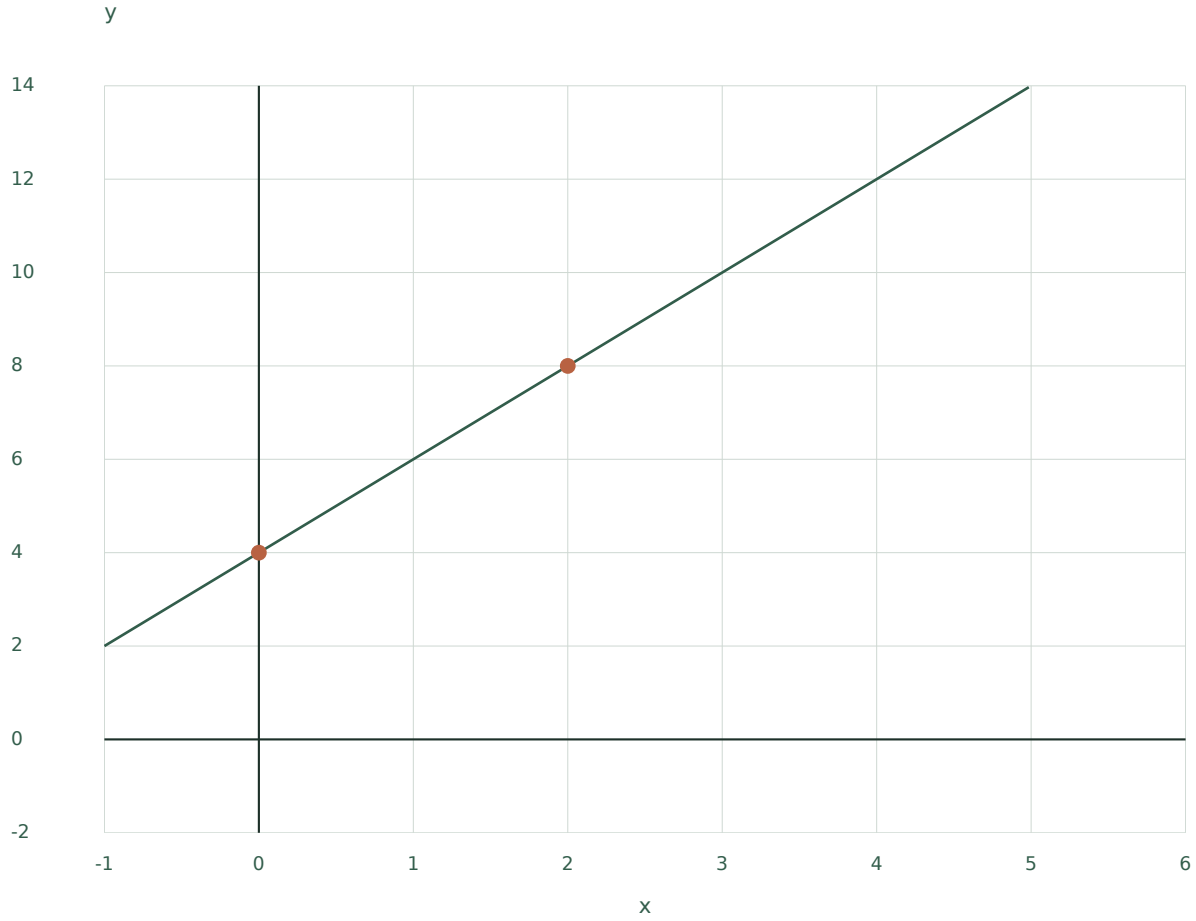
Answer: No, not from one point alone. A single point does not show whether the graph is a straight line through the origin. More information, such as a drawn line or additional points, is needed.

Reason: Proportionality requires a straight line through (0,0). One point cannot establish either the shape or the origin passage.

Check: Ask whether the graph provides a line or at least two points that determine shape. If not, state that the judgment cannot be made.

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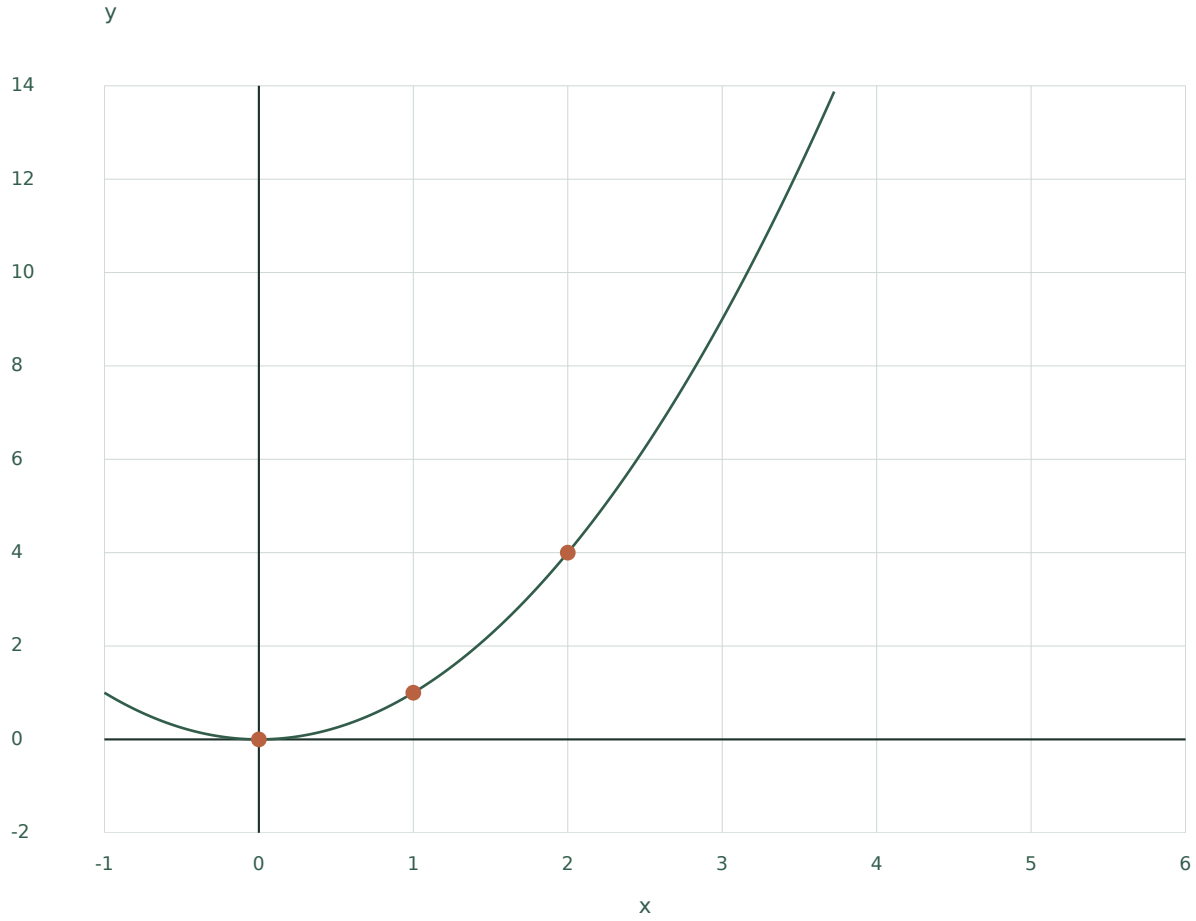
Task 1 / graph key



Given graph from the original prompt. The curved example uses y=x^2 as a chosen curve through its stated points. The single-point task deliberately has NO added line.

Identify Proportional Graphs: Straight Lines Through the Origin

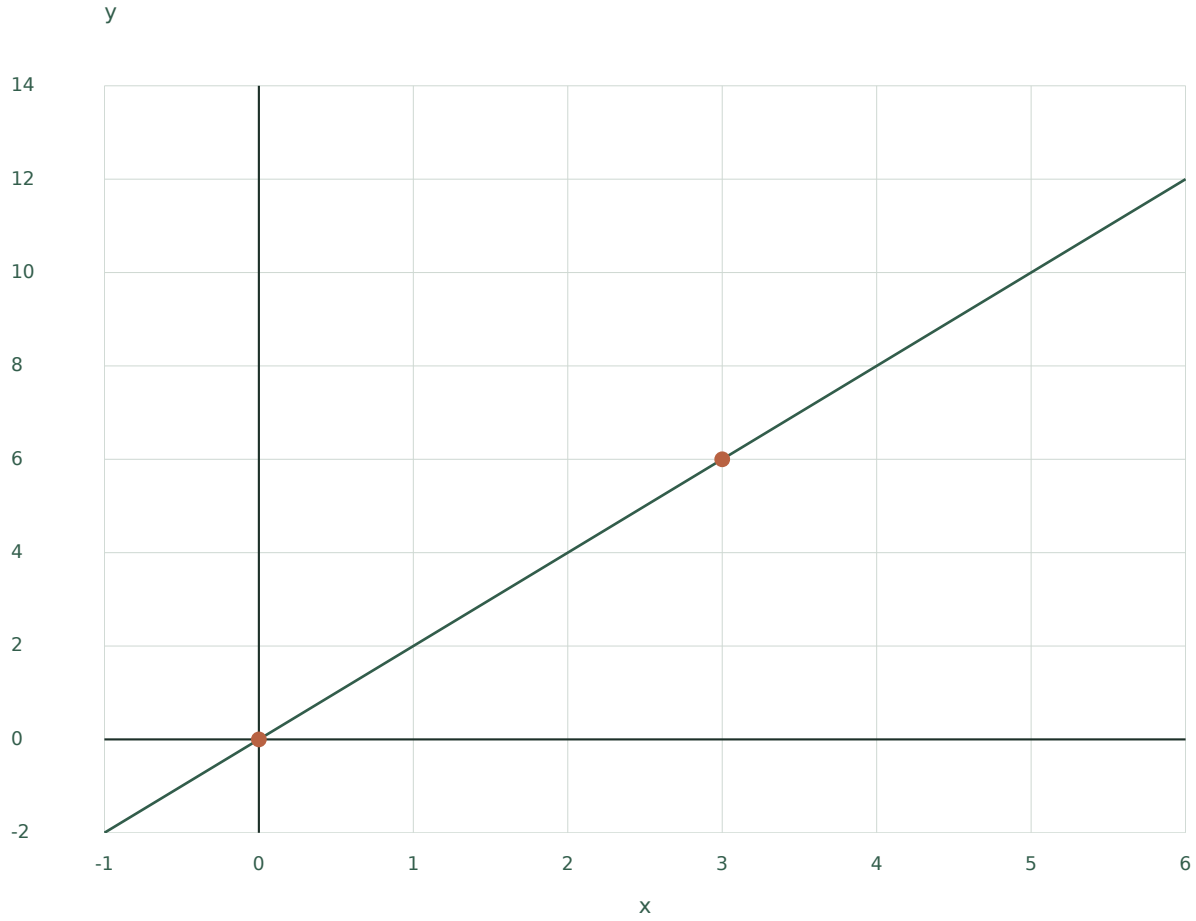
Task 2 / graph key



Given graph from the original prompt. The curved example uses y=x^2 as a chosen curve through its stated points. The single-point task deliberately has NO added line.

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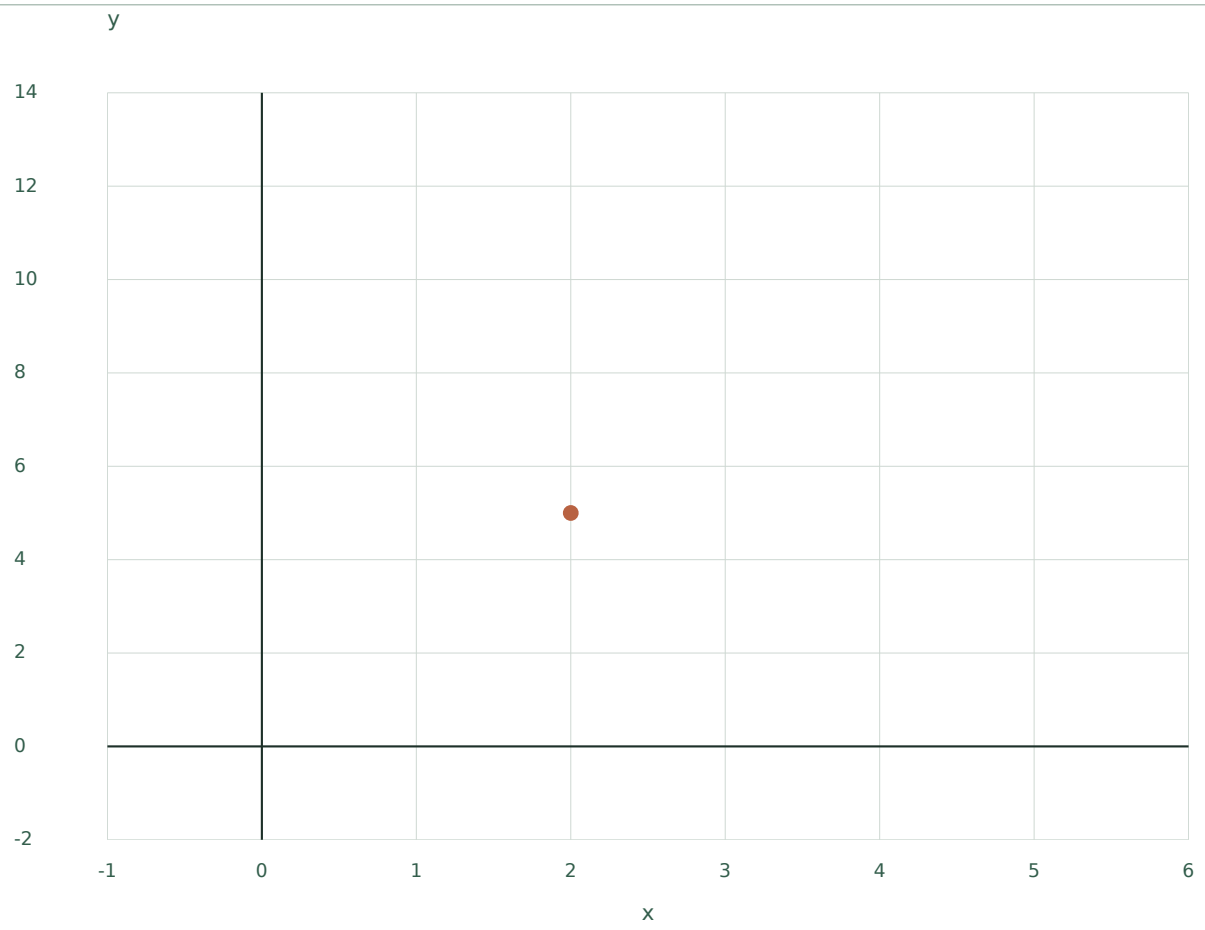
Task 3 / graph key



Given graph from the original prompt. The curved example uses y=x^2 as a chosen curve through its stated points. The single-point task deliberately has NO added line.

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Task 4 / graph key



Given graph from the original prompt. The curved example uses y=x^2 as a chosen curve through its stated points. The single-point task deliberately has NO added line.

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Source rubric / reflection

- [ ] States a clear yes or no judgment.
- [ ] Checks both conditions: straight line and passage through the origin.
- [ ] Provides a justification naming a specific feature, such as 'straight line through (0,0)' or 'y-intercept not zero'.
- [ ] Uses correct coordinates and consistent units when citing points.
- [ ] Avoids claiming proportionality from a single point or from origin passage alone.

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