Plot and Read Line Graphs with Negative Values

Complete worked example / separate answer key

A table shows temperatures at four times: 8:00 = -6, 10:00 = -2, 12:00 = 3, 14:00 = 1 (degrees Celsius). Plot these on a line graph with a vertical axis from -8 to 4 in steps of 2, then read the value at 10:00.

Answer: Plot points at (8:00, -6), (10:00, -2), (12:00, 3), and (14:00, 1). Connect them in order. Reading at 10:00 gives -2 degrees Celsius.

Plot and Read Line Graphs with Negative Values

Original tasks 1, 2, 3 / complete keys

Task 1

Plot these values on a line graph with a vertical axis from -6 to 6 in steps of 1: Monday = -4, Tuesday = 0, Wednesday = 5, Thursday = -1. Then read the value for Thursday.

Answer: Thursday = -1.

Reason: Start at zero, move down 1 unit for Thursday, and mark the point. Reading back to the axis gives -1.

Check: Count grid steps from zero down toward the Thursday point. On a scale of 1 per grid line, -1 is exactly one grid line below zero, so confirm the point sits on that line and read it as -1.

Task 2

A graph shows points at (1, -3), (2, 2), (3, -5), and (4, 0). Describe where each point lies relative to zero and state which point is lowest.

Answer: Point (1, -3) is below zero; (2, 2) is above zero; (3, -5) is below zero; (4, 0) is on zero. The lowest point is (3, -5).

Reason: Negative second coordinates lie below zero, positive above, and zero on the axis. The most negative value is lowest.

Check: Compare the second coordinates: -3, 2, -5, 0. The smallest is -5, so (3, -5) is lowest.

Task 3

Using a vertical axis from -10 to 10 in steps of 5, plot: 6:00 = -8, 9:00 = -3, 12:00 = 7, 15:00 = 2. Read the value at 9:00 and state whether the line rises or falls from 6:00 to 9:00.

Answer: Value at 9:00 is -3. The line rises from -8 to -3.

Reason: Plot each point by moving up or down from zero. From -8 to -3 the value increases by 5, so the line goes upward.

Check: Count steps: -8 is below zero, -3 is closer to zero, so the segment slopes upward. Confirm -3 is three units below zero.

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Original tasks 4 / complete keys

Task 4

A line graph has points at (A, -2), (B, 4), (C, -6), and (D, 1). Without drawing, list the points in order from lowest to highest value, and explain how the graph would cross zero between B and C.

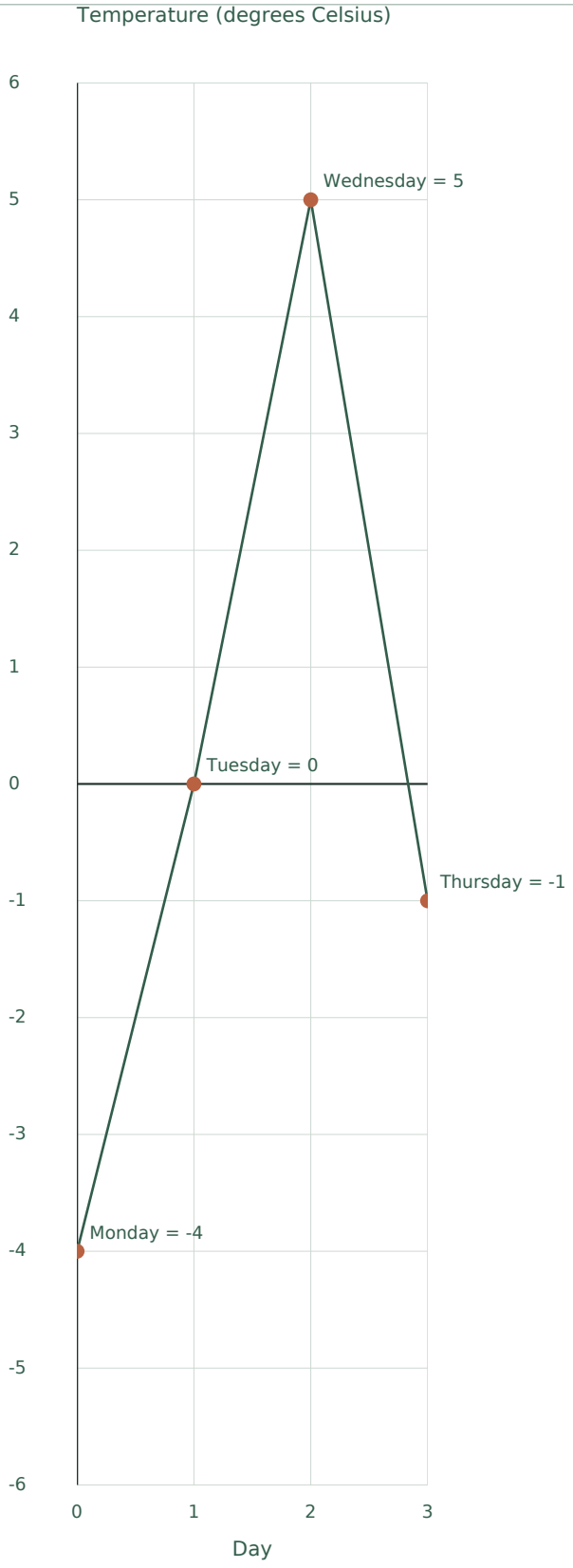
Answer: Order: C (-6), A (-2), D (1), B (4). Between B (4) and C (-6) the line goes from positive to negative, so it crosses zero.

Reason: Compare values directly. A segment from a positive to a negative value must pass through zero.

Check: Sort the values: -6 < -2 < 1 < 4. Check that B is positive and C is negative, so zero lies between them.

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Task 1 / Completed Graph: Monday to Thursday



Thursday = -1.

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Worked example, Task 1, Task 2, Task 3, Task 4 / Answer Key

Completed graph and reading answers with signs and units.

Worked example: Plot points at (8:00, -6), (10:00, -2), (12:00, 3), and (14:00, 1). Connect them in order. Reading at 10:00 gives -2 degrees Celsius.

Exercise 1: Thursday = -1.

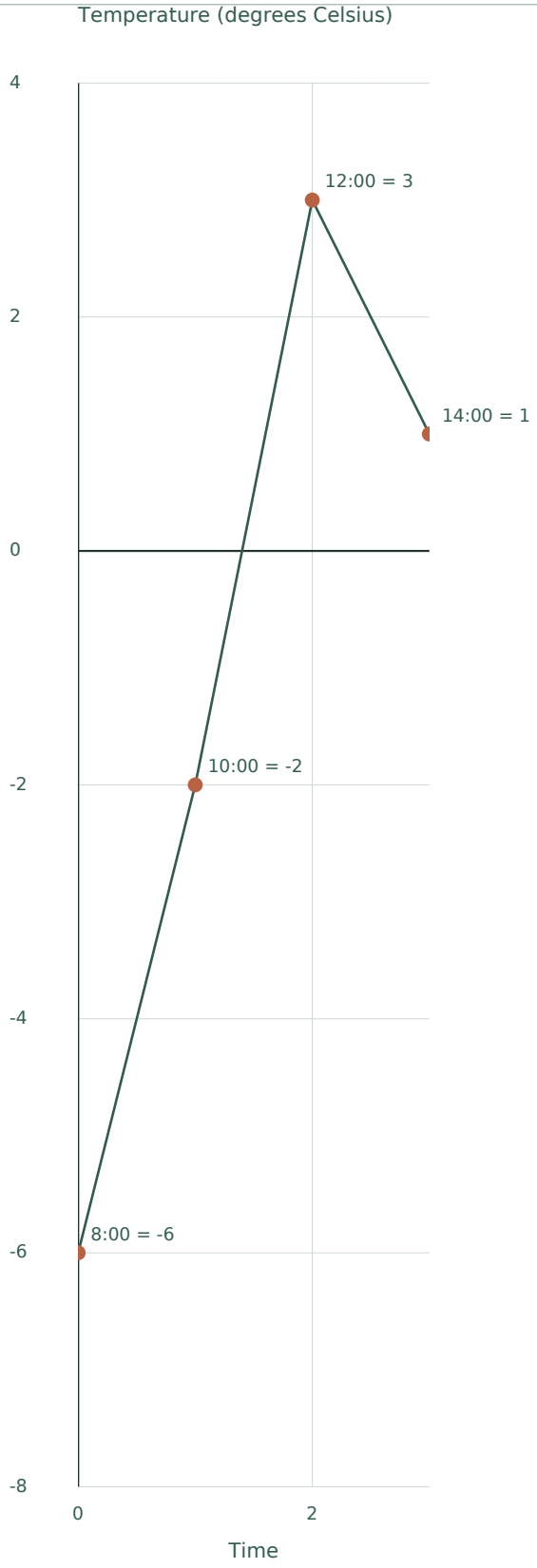
Exercise 2: Point (1, -3) is below zero; (2, 2) is above zero; (3, -5) is below zero; (4, 0) is on zero. The lowest point is (3, -5).

Exercise 3: Value at 9:00 is -3. The line rises from -8 to -3.

Exercise 4: Order: C (-6), A (-2), D (1), B (4). Between B (4) and C (-6) the line goes from positive to negative, so it crosses zero.

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Worked example / Worked Example: Temperatures from 8:00 to 14:00



Read at 10:00: -2 degrees Celsius.

Plot and Read Line Graphs with Negative Values

Source rubric / reflection

- [ ] Vertical axis includes zero and is labeled with a consistent scale.
- [ ] All four points are plotted at the correct grid intersections, with negative values below zero.
- [ ] Points are connected in the correct time order.
- [ ] Reading answers include the correct sign and unit.
- [ ] Marker placement is clear: the center of each marker sits on the correct grid intersection, with acceptable style variation.

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