Drawing Real-Life Graphs: Distance-Time and Cost-Quantity Practice

Original tasks 1, 2, 3 / complete keys

Task 1

A walker starts 0 meters from a bench. He walks away at 60 meters per minute for 4 minutes, rests for 2 minutes, then walks back to the bench at 80 meters per minute. Plot the key points on a distance-time graph and state the time he returns to the bench.

Answer: Key points: (0, 0), (4, 240), (6, 240), and return at (9, 0). He returns at 9 minutes.

Reason: Distance after 4 minutes is 60 times 4 = 240 meters. The rest keeps distance at 240 meters from 4 to 6 minutes. The return takes 240 divided by 80 = 3 minutes, so 6 + 3 = 9 minutes.

Check: Compute the return time from the graph segment: vertical change 240 meters divided by horizontal change 3 minutes gives 80 meters per minute, matching the scenario.

Task 2

A market stall charges a fixed 5 dollars to set up and 2 dollars per item sold. Plot a cost-quantity graph for 0 to 6 items. Find the cost for 4 items and the slope.

Answer: Key points: (0, 5), (1, 7), (2, 9), (3, 11), (4, 13), (5, 15), (6, 17). Cost for 4 items is 13 dollars. Slope is 2 dollars per item.

Reason: Cost equals 5 plus 2 times quantity. At quantity 4, cost is 5 + 8 = 13. The vertical intercept is 5, and each additional item adds 2 dollars, so slope is 2.

Check: Pick two points such as (2, 9) and (4, 13): vertical change 4 divided by horizontal change 2 gives 2 dollars per item.

Task 3

A car travels at 90 kilometers per hour for 2 hours, stops for 1 hour, then travels at 60 kilometers per hour for 1 hour. Draw a distance-time graph using hours and kilometers. Find the total distance and the time of the final point.

Answer: Key points: (0, 0), (2, 180), (3, 180), (4, 240). Total distance is 240 kilometers at 4 hours.

Reason: First segment: 90 times 2 = 180 kilometers. Stop keeps distance at 180 kilometers from 2 to 3 hours. Final segment: 60 times 1 = 60 kilometers, so 180 + 60 = 240 kilometers at 4 hours.

Check: Check the final segment slope: vertical change 60 kilometers divided by horizontal change 1 hour gives 60 kilometers per hour, matching the scenario.

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Original tasks 4 / complete keys

Task 4

A phone plan costs a fixed 10 dollars per month plus 0.50 dollars per gigabyte used. Plot a cost-quantity graph for 0 to 8 gigabytes. Find the cost for 6 gigabytes and explain the vertical intercept.

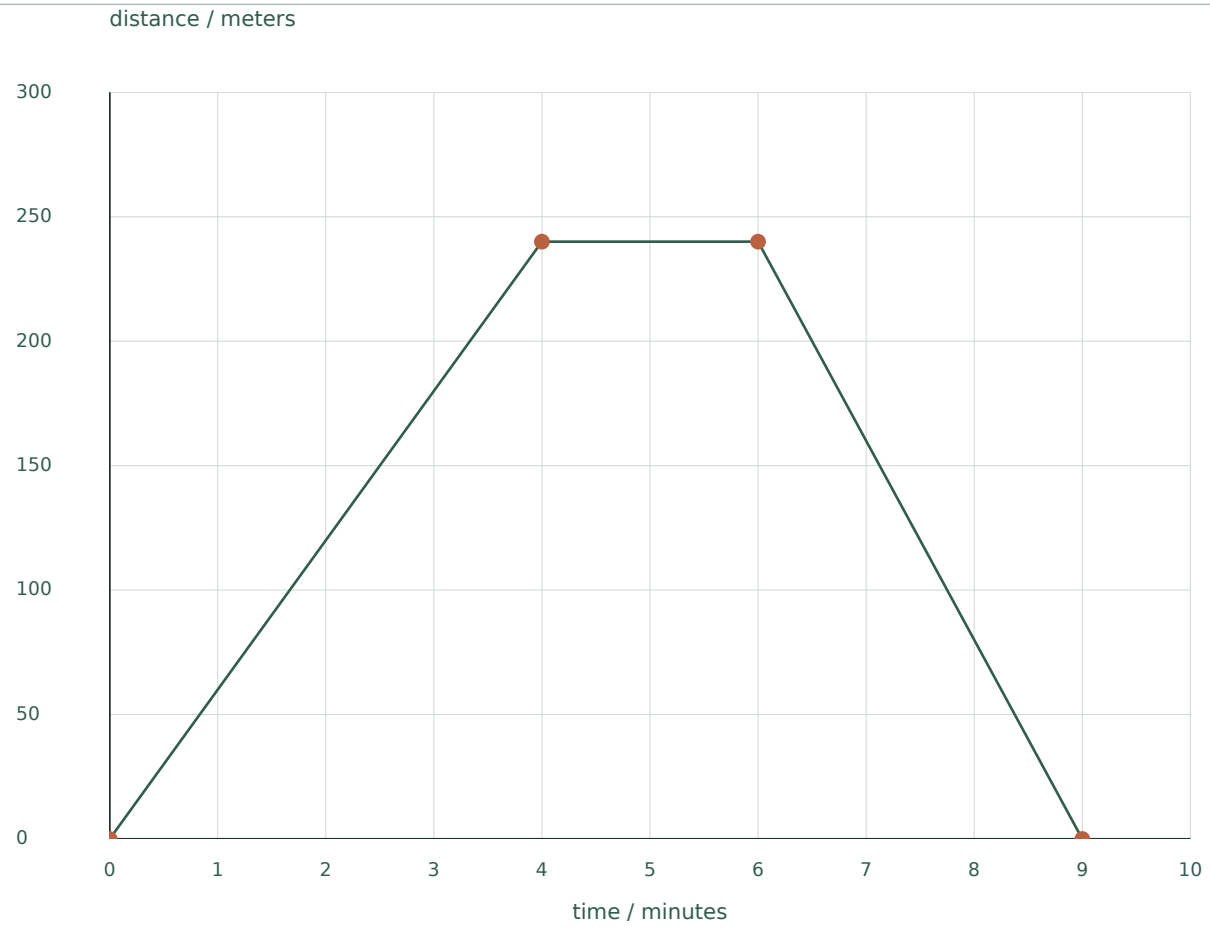
Answer: Key points: (0, 10), (2, 11), (4, 12), (6, 13), (8, 14). Cost for 6 gigabytes is 13 dollars. The vertical intercept is 10 dollars, the fixed monthly fee.

Reason: Cost equals 10 plus 0.50 times gigabytes. At 6 gigabytes, cost is 10 + 3 = 13. The intercept at quantity zero is the fixed fee before any data is used.

Check: Compute slope from (2, 11) and (6, 13): vertical change 2 divided by horizontal change 4 gives 0.50 dollars per gigabyte, matching the scenario.

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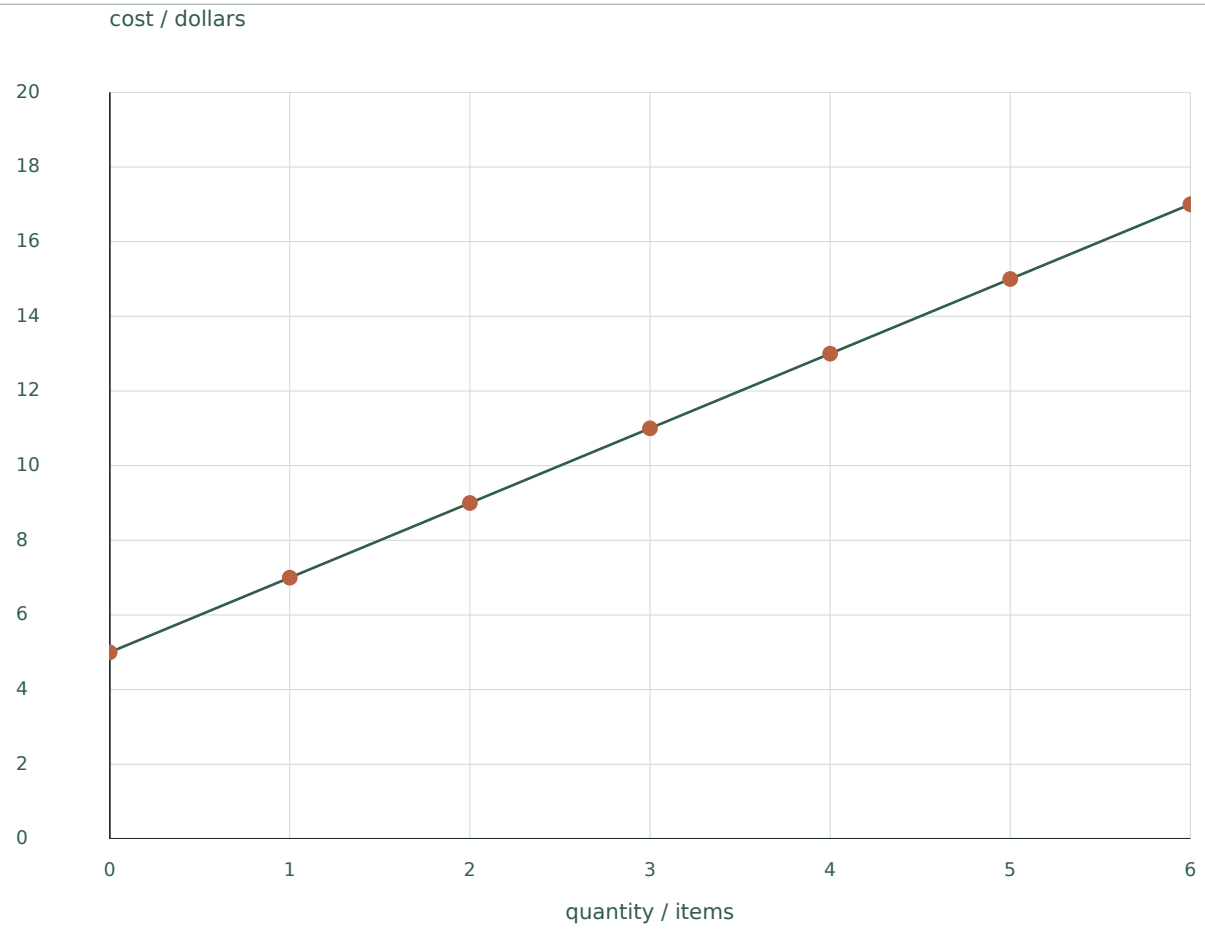
Task 1 / graph key



Axis scales use the stated units independently. Segment endpoints and plateaus follow the original times, rates and fixed charges.

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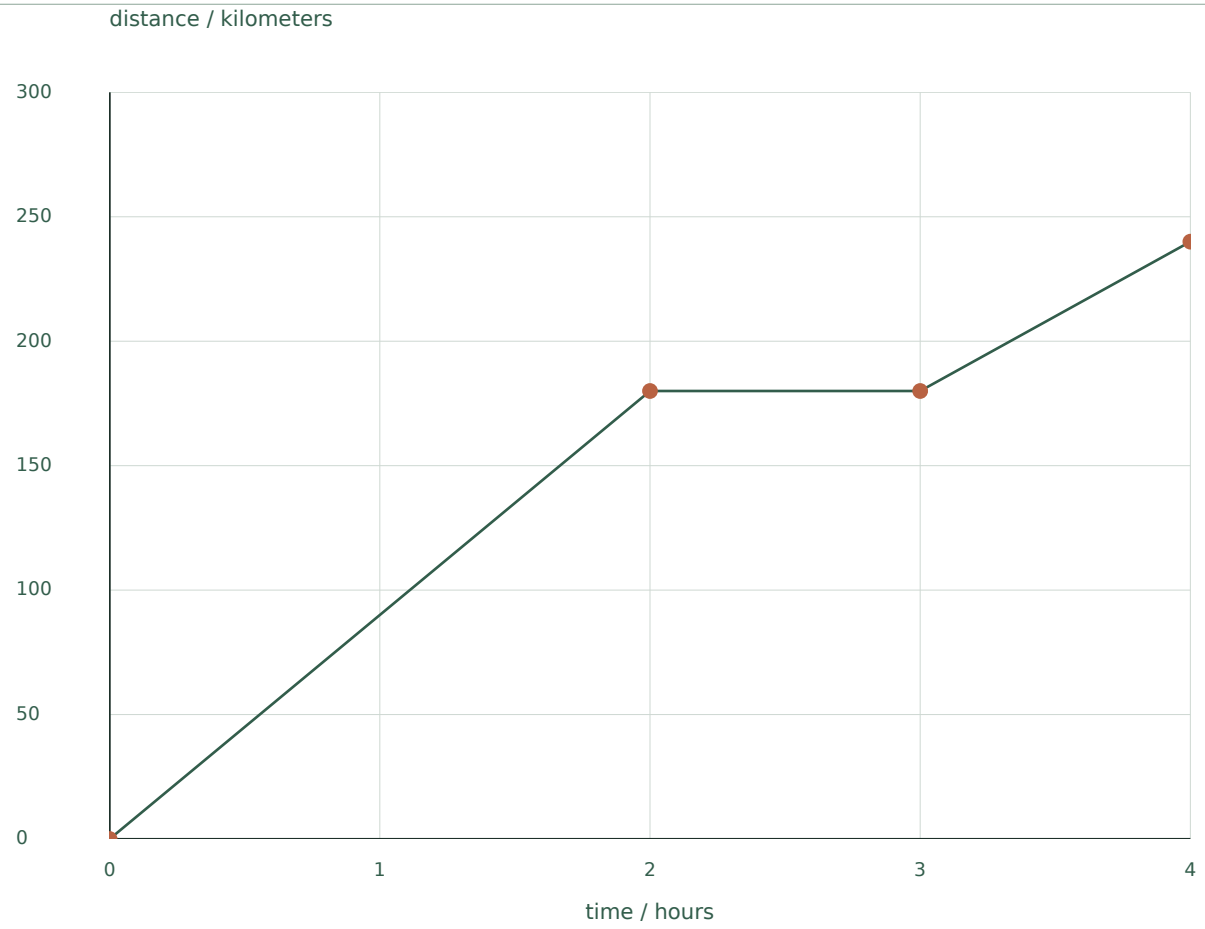
Task 2 / graph key



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Drawing Real-Life Graphs: Distance-Time and Cost-Quantity Practice

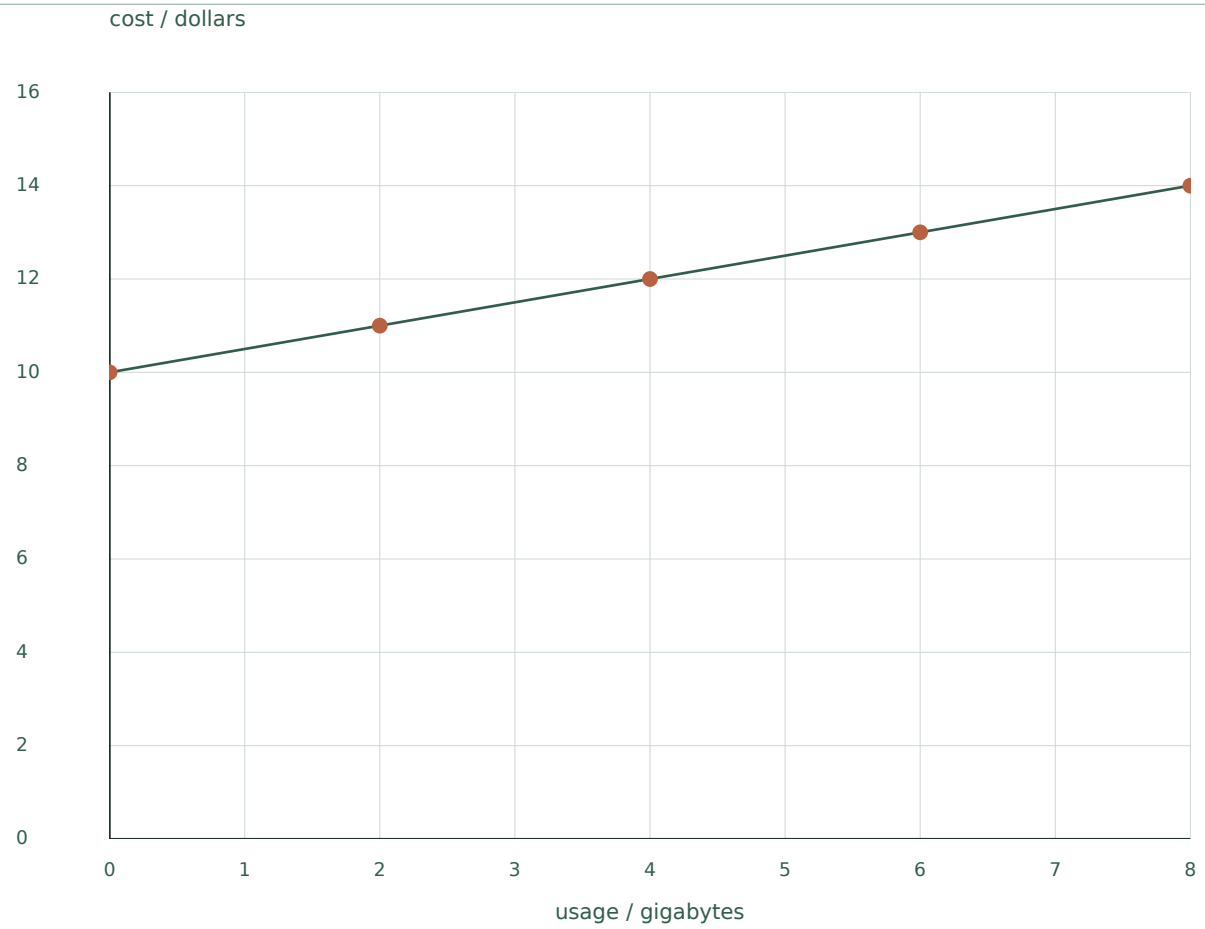
Task 3 / graph key



Axis scales use the stated units independently. Segment endpoints and plateaus follow the original times, rates and fixed charges.

Drawing Real-Life Graphs: Distance-Time and Cost-Quantity Practice

Task 4 / graph key



Axis scales use the stated units independently. Segment endpoints and plateaus follow the original times, rates and fixed charges.

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Source rubric / reflection

- [ ] Axes are drawn, labeled with variable and unit, and the scale is stated.
- [ ] Key points are plotted accurately and consistently with the chosen scale.
- [ ] Segments or curves match the described rates, stops, and changes.
- [ ] At least one rate is computed correctly with units and checked against the scenario.
- [ ] Intercepts are identified and explained in the context of the scenario.
- [ ] Valid alternative choices, such as swapped axes with clear labels or a different consistent scale, are accepted if interpretation remains correct.

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