Graphing Horizontal and Vertical Lines: x = a and y = b

Original tasks 1, 2, 3 / complete keys

Task 1

Graph y = 4 on a grid with equal spacing and state its slope.

Answer: A horizontal line through 4 on the y-axis, labeled y = 4, with slope 0.

Reason: The equation fixes y at 4 while x varies. Test points include (0, 4), (2, 4), and (-3, 4). Connecting them gives a line parallel to the x-axis. Between (0, 4) and (2, 4), the change in y is 0 and the change in x is 2, so slope is 0 divided by 2, which equals 0.

Check: Substitute each plotted point into y = 4; all should satisfy it. Confirm the line is parallel to the x-axis and the label is complete.

Task 2

Graph x = 2 on a grid with equal spacing and state its slope.

Answer: A vertical line through 2 on the x-axis, labeled x = 2, with undefined slope.

Reason: The equation fixes x at 2 while y varies. Test points include (2, 0), (2, 3), and (2, -1). Connecting them gives a line parallel to the y-axis. Between (2, 0) and (2, 3), the change in y is 3 and the change in x is 0, so slope is 3 divided by 0, which is undefined.

Check: Substitute each plotted point into x = 2; all should satisfy it. Confirm the line is parallel to the y-axis and the slope is stated as undefined, not 0.

Task 3

A classmate graphs y = -1 as a vertical line through -1 on the x-axis. Identify the error and describe the correct graph.

Answer: The classmate fixed the wrong variable. The correct graph is a horizontal line through -1 on the y-axis, labeled y = -1, with slope 0.

Reason: In y = -1 the y-coordinate is fixed at -1 and x varies, so the line runs left to right. Valid test points include (0, -1), (2, -1), and (-3, -1). A vertical line through -1 on the x-axis would be x = -1, a different equation.

Check: Read the equation and name the fixed variable. Plot three test points and confirm they share a y-coordinate of -1 and form a horizontal line.

Graphing Horizontal and Vertical Lines: x = a and y = b

Original tasks 4 / complete keys

Task 4

Without graphing, decide whether each line is horizontal or vertical and give its slope: x = 5, y = 0, y = -3, x = 0.

Answer: x = 5 is vertical with undefined slope; y = 0 is horizontal with slope 0; y = -3 is horizontal with slope 0; x = 0 is vertical with undefined slope.

Reason: An equation naming only x fixes the x-coordinate, so the line is vertical and its slope is undefined. An equation naming only y fixes the y-coordinate, so the line is horizontal and its slope is 0. The constants 5, 0, -3, and 0 do not change the line type.

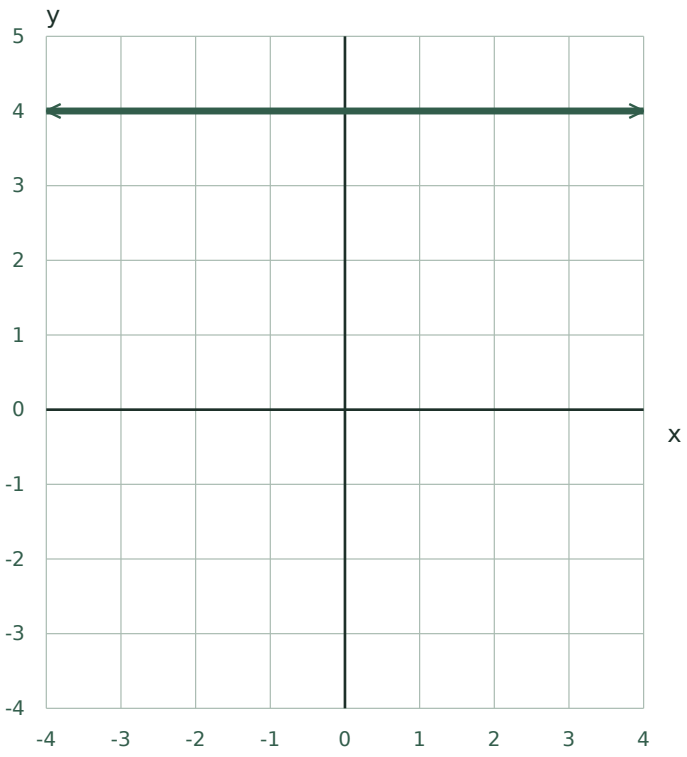
Check: For each equation, substitute two sample points and compute the slope. A zero numerator gives slope 0; a zero denominator gives undefined slope.

Graphing Horizontal and Vertical Lines: x = a and y = b

Task 1 / completed source graph

Graph y = 4 on a grid with equal spacing and state its slope.

Line 1 (solid green): y = 4



A complete line continues beyond this display window; arrowheads show continuation.

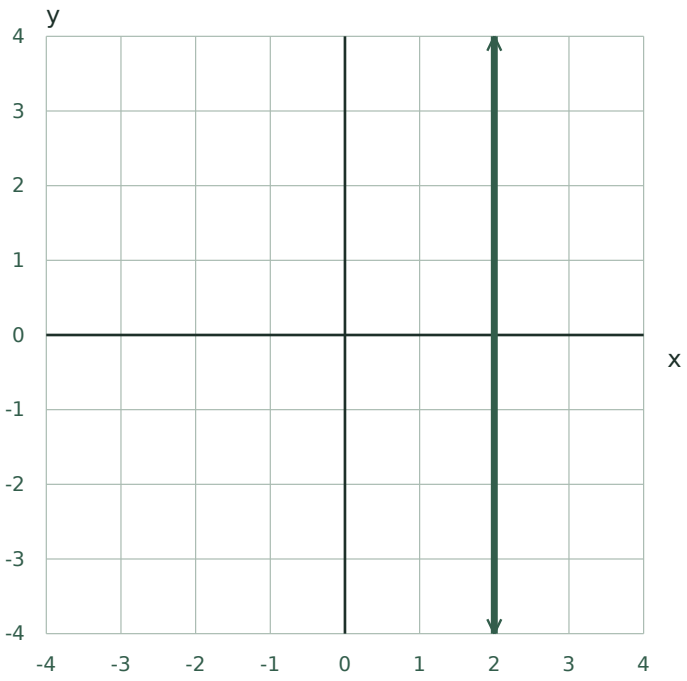
Horizontal interval = 1; vertical interval = 1. This is a display window, not a new domain.

Graphing Horizontal and Vertical Lines: x = a and y = b

Task 2 / completed source graph

Graph x = 2 on a grid with equal spacing and state its slope.

Line 1 (solid green): x = 2



A complete line continues beyond this display window; arrowheads show continuation.

Horizontal interval = 1; vertical interval = 1. This is a display window, not a new domain.

Graphing Horizontal and Vertical Lines: x = a and y = b

Original rubric / reflection

- [ ] The line passes through the correct constant on the correct axis.
- [ ] At least three plotted points satisfy the equation.
- [ ] The line is straight and parallel to the appropriate axis.
- [ ] The label gives the full equation, not just the number.
- [ ] The stated slope matches the line type: 0 for horizontal, undefined for vertical.
- [ ] Valid alternative presentations, such as labeling at either end of the line or using a different set of test points, are accepted when the mathematics is correct.

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