Drawing Piecewise Functions: Breakpoints and Endpoint Notation

Worksheet: Four Piecewise Graphing Tasks

Hypothetical example values; one grid square = one unit on both axes. Use open circles for excluded endpoints and filled circles for included endpoints.

Task 1: Graph g(x) = x + 2 for x <= 0, and g(x) = 3 for x > 0. Mark the breakpoint at x = 0.

Task 2: Graph h(x) = -x + 4 for x < 2, and h(x) = x - 1 for x >= 2. Mark the breakpoint at x = 2.

Task 3: Graph k(x) = 1 for x < -1, k(x) = x + 1 for -1 <= x <= 2, and k(x) = 5 for x > 2. Mark both breakpoints.

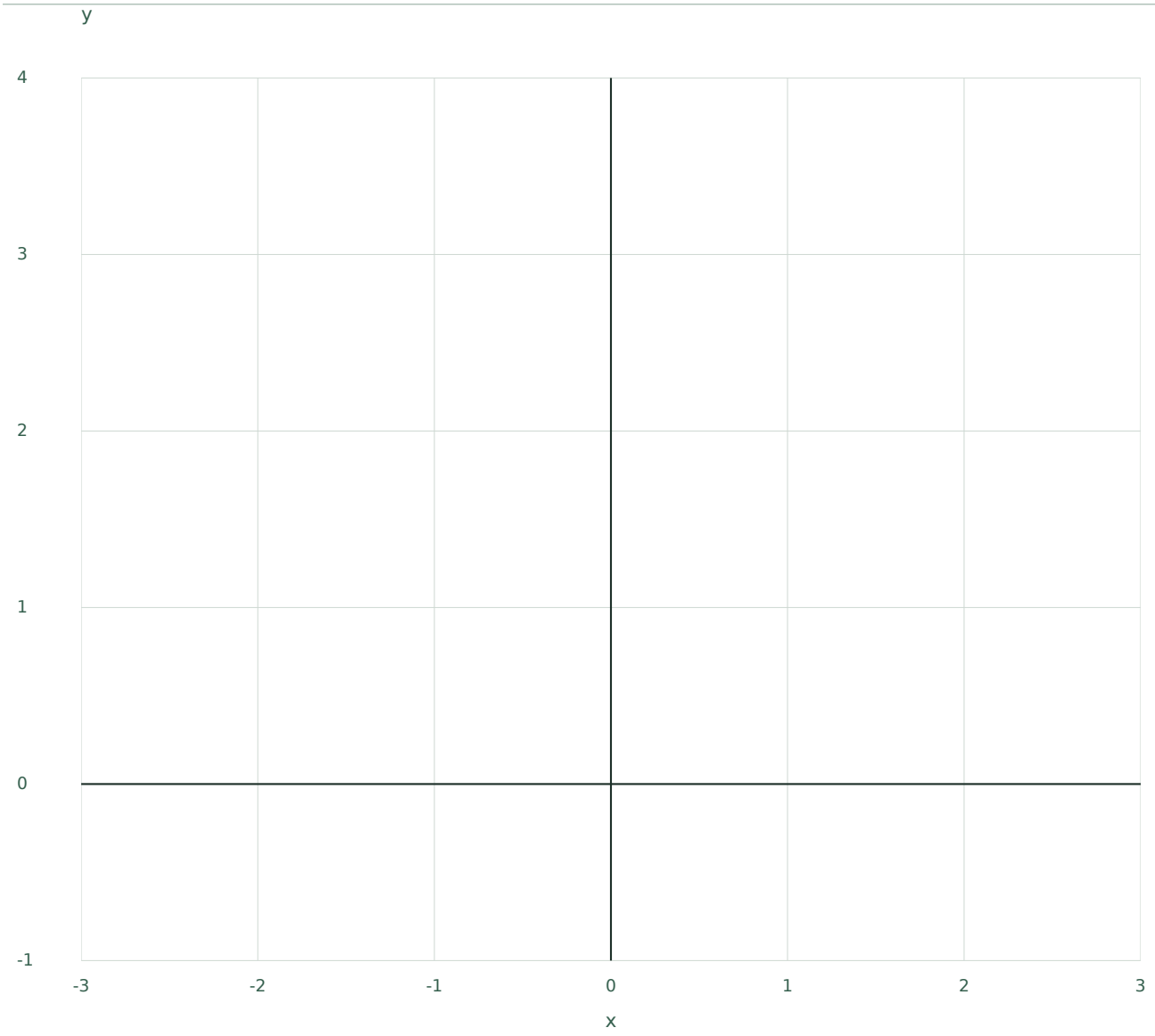
Task 4: Graph m(x) = 2x for x < 1, m(x) = 3 for x = 1, and m(x) = x + 1 for x > 1. Mark the breakpoint at x = 1 with all three pieces.

Plotting routine: (1) list each segment with formula and interval; (2) mark each breakpoint on the x-axis and label open or closed; (3) choose two interior x-values per segment and compute y; (4) plot only points inside the segment interval; (5) connect interior points; (6) place open or closed dots at breakpoints and remove any line beyond an interval.

Scale: write the scale at the corner of each grid. Use open circles for excluded endpoints and filled circles for included endpoints. Keep dot size small enough that coordinates remain readable. Check that no segment extends past its stated interval.

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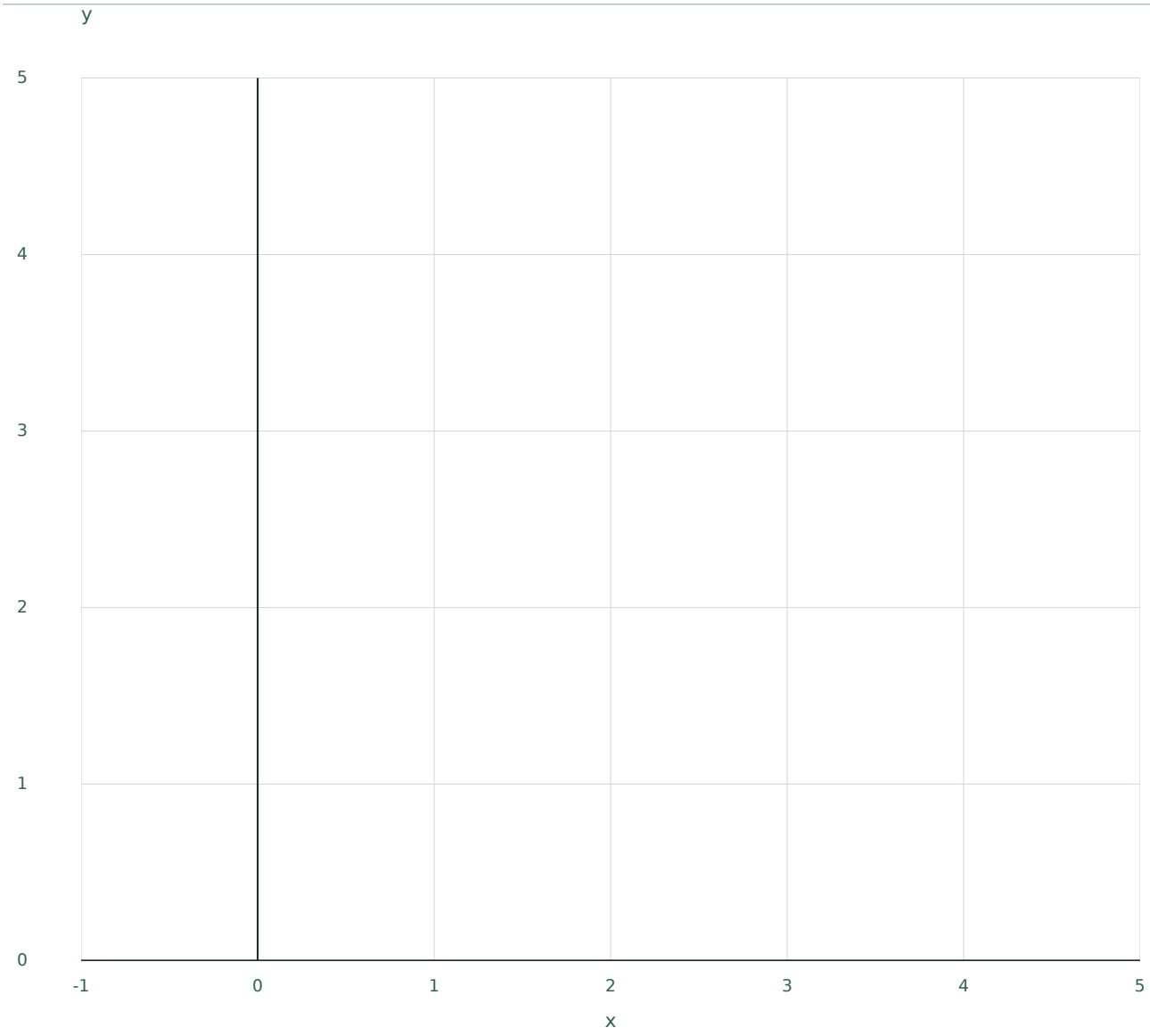
Task 1 Blank Grid



Student blank grid for Task 1.

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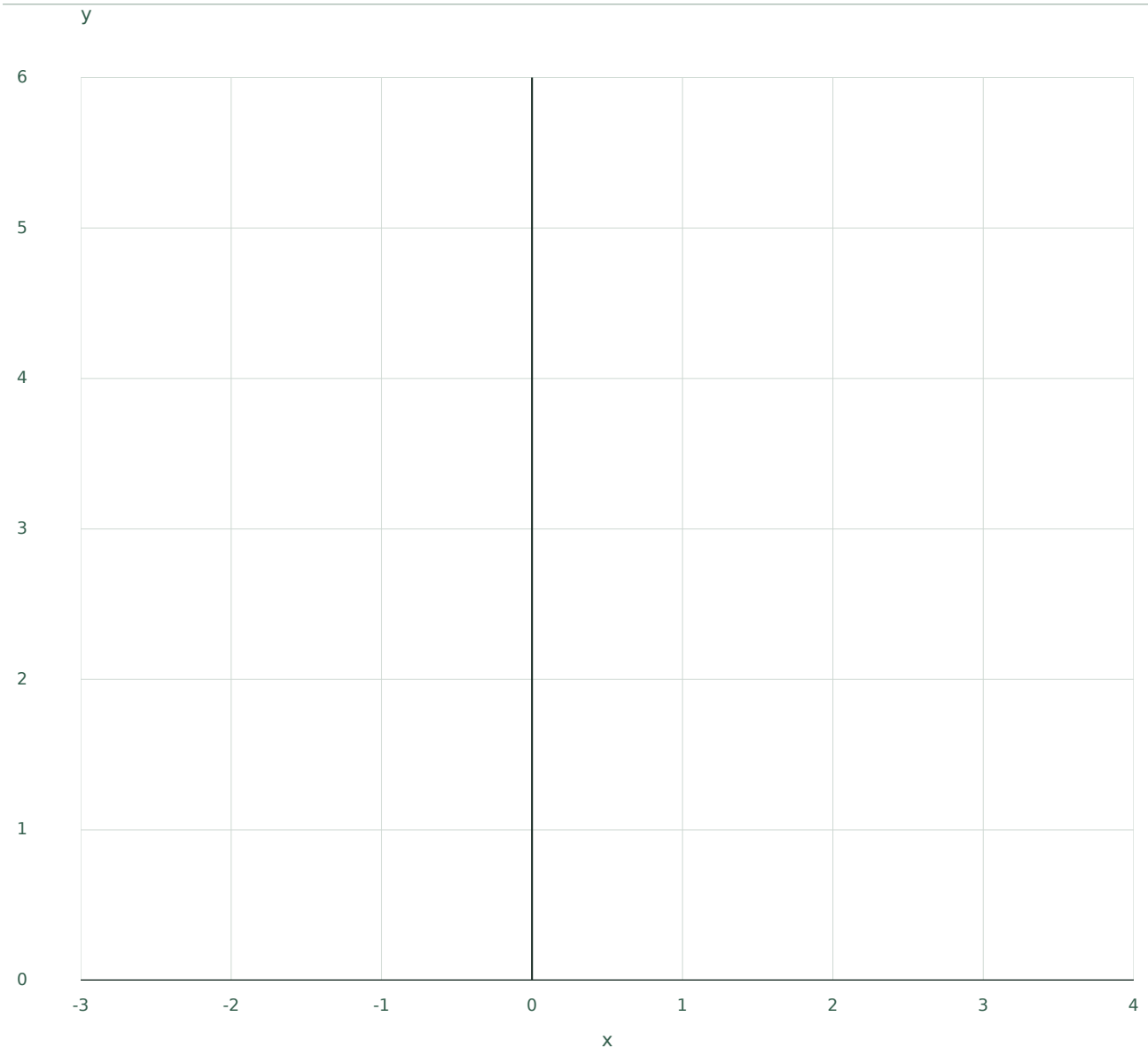
Task 2 Blank Grid



Student blank grid for Task 2.

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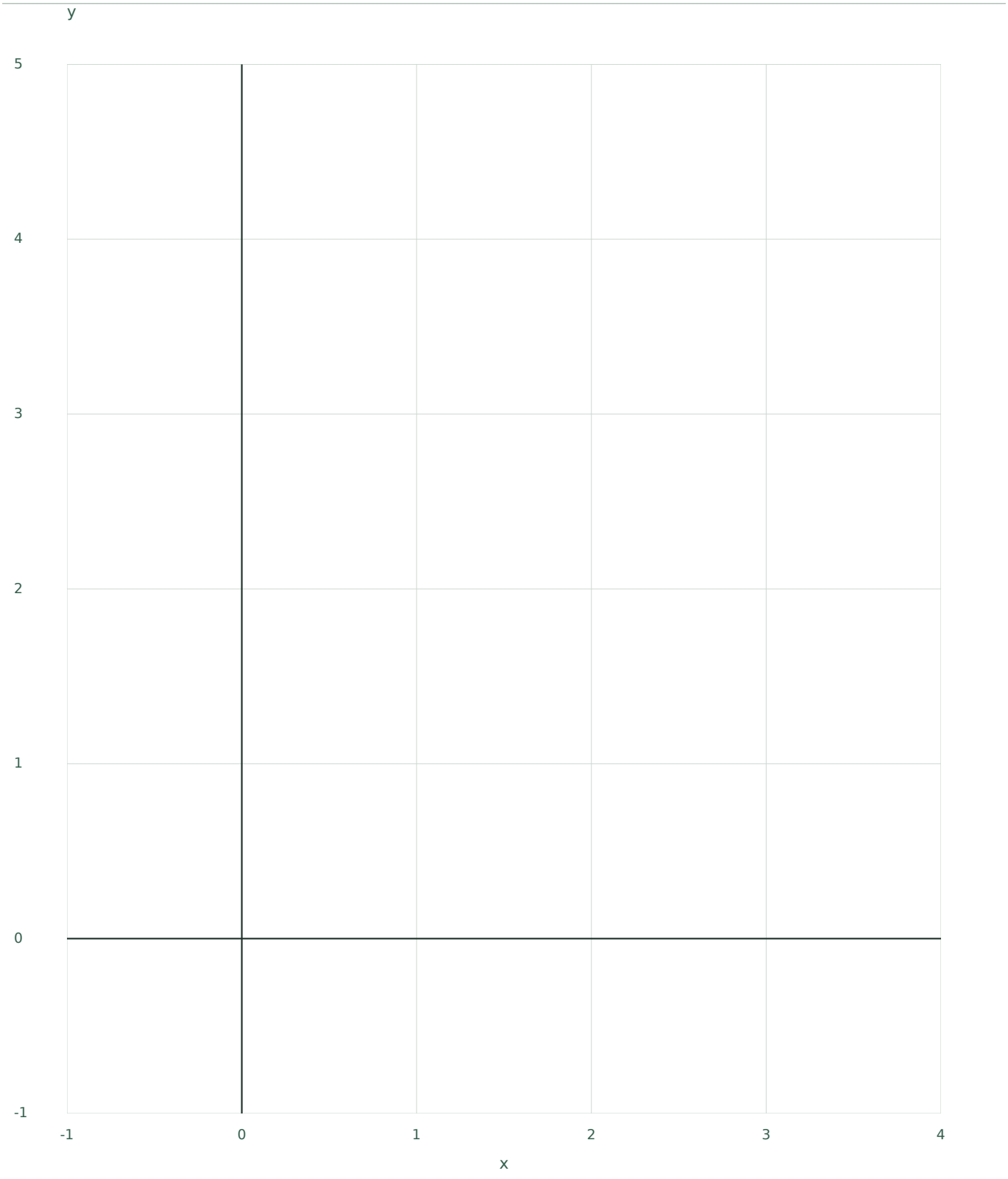
Task 3 Blank Grid



Student blank grid for Task 3.

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Task 4 Blank Grid



Student blank grid for Task 4.

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Interval Table Template

Hypothetical example values; one grid square = one unit on both axes.

Segment	Interval	Endpoint status	Sample points

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Original tasks 1, 2, 3 / blank responses

Task 1

Graph g(x) = x + 2 for x <= 0, and g(x) = 3 for x > 0. Mark the breakpoint at x = 0.

Task 2

Graph h(x) = -x + 4 for x < 2, and h(x) = x - 1 for x >= 2. Mark the breakpoint at x = 2.

Task 3

Graph k(x) = 1 for x < -1, k(x) = x + 1 for -1 <= x <= 2, and k(x) = 5 for x > 2. Mark both breakpoints.

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Original tasks 4 / blank responses

Task 4

Graph $m(x) = 2x$ for $x < 1$, $m(x) = 3$ for $x = 1$, and $m(x) = x + 1$ for $x > 1$. Mark the breakpoint at $x = 1$ with all three pieces.