Graphing Inequalities Matching Activity: Pair Statements to Shaded Half-Planes

Original tasks 1, 2, 3 / complete keys

Task 1

An inequality card reads $y > 3x - 2$. A graph shows a dashed line with slope 3 and y-intercept -2, and the region above the line is shaded. Does the graph match? Use the test point (0,0).

Answer: Yes, the graph matches.

Reason: The boundary $y = 3x - 2$ has slope 3 and y-intercept -2, matching the card. The symbol $>$ is strict, so the boundary should be dashed, and it is. Test (0,0): $0 > 3(0) - 2$ gives $0 > -2$, which is true, so the origin side, above the line, should be shaded. The graph shades above the line.

Check: Verify the slope and intercept, confirm dashed boundary for $>$, and confirm that (0,0) satisfies the inequality and lies in the shaded region.

Task 2

An inequality card reads $x \leq 4$. A graph shows a solid vertical line at $x = 4$ with the region to the left shaded. Does the graph match? Use the test point (0,0).

Answer: Yes, the graph matches.

Reason: The boundary $x = 4$ is vertical. The symbol $\leq$ is non-strict, so the boundary should be solid, and it is. Test (0,0): $0 \leq 4$ is true, so the side containing the origin, which is to the left of $x = 4$, should be shaded. The graph shades to the left.

Check: Confirm the vertical boundary at $x = 4$, confirm solid boundary for $\leq$, and check that (0,0) satisfies $x \leq 4$ and lies in the shaded left region.

Task 3

An inequality card reads $y < -x + 1$. A graph shows a solid line with slope -1 and y-intercept 1, and the region below the line is shaded. Does the graph match? Use the test point (0,0).

Answer: No, the graph does not match.

Reason: The boundary $y = -x + 1$ has slope -1 and y-intercept 1, which agrees with the card. However, the symbol $<$ is strict, so the boundary should be dashed, but the graph shows a solid line. Also test (0,0): $0 < -0 + 1$ gives $0 < 1$, which is true, so the origin side, below the line, should be shaded; the shading is correct, but the boundary type is wrong.

Check: Check the symbol $<$ for a dashed boundary; the solid line is inconsistent. Confirm the test point (0,0) satisfies the inequality and lies in the shaded region, but the boundary type alone makes the match invalid.

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Original tasks 4 / complete keys

Task 4

An inequality card reads $y \geq 2x + 1$. A graph shows a dashed line with slope 2 and y-intercept 1, and the region above the line is shaded. Does the graph match? Use the test point (0,0).

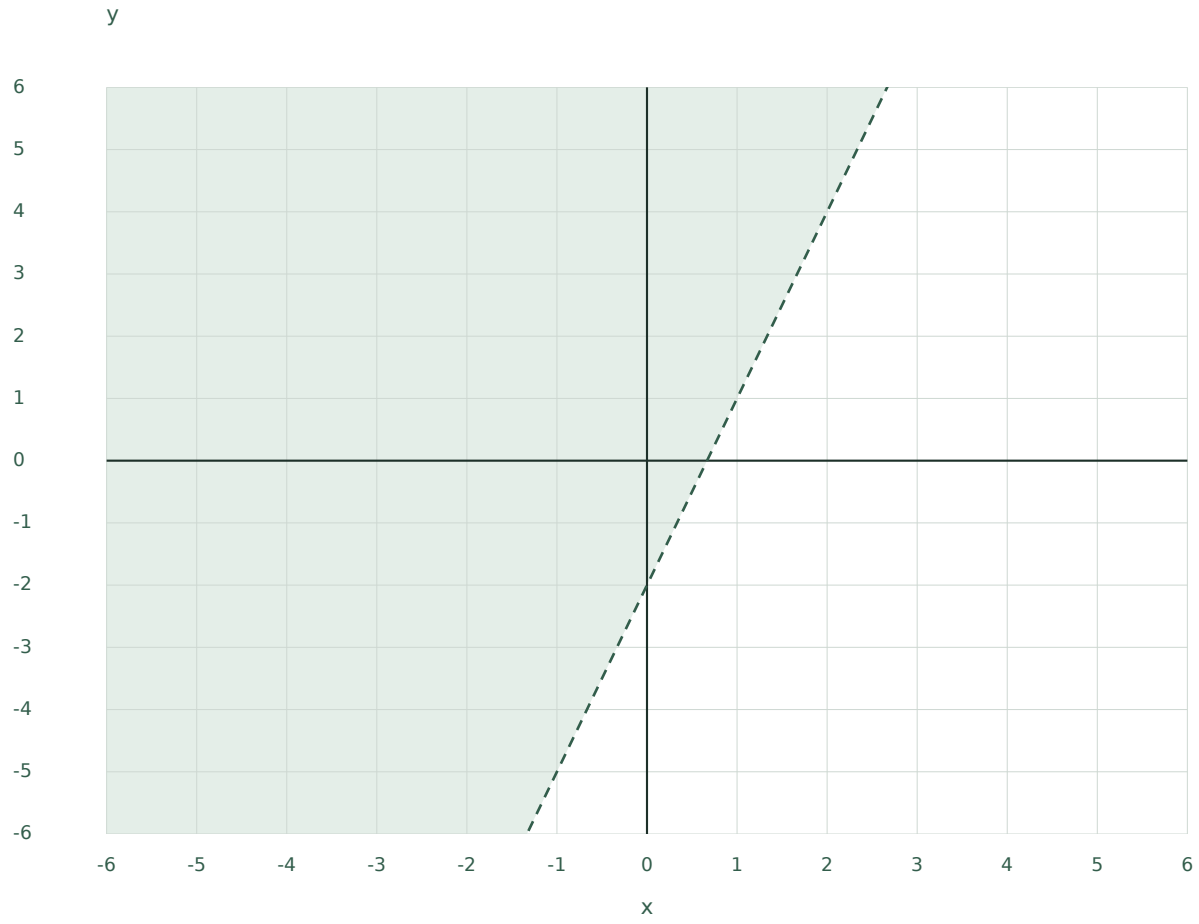
Answer: No, the graph does not match.

Reason: The boundary $y = 2x + 1$ has slope 2 and y-intercept 1, matching the card. The symbol $\geq$ is non-strict, so the boundary should be solid, but the graph shows a dashed line. Test (0,0): $0 \geq 2(0) + 1$ gives $0 \geq 1$, which is false, so the origin side, below the line, should not be shaded; the graph shades above the line, which is the correct side for this inequality, but the boundary type is wrong.

Check: Check the symbol $\geq$ for a solid boundary; the dashed line is inconsistent. Confirm that (0,0) does not satisfy the inequality and that the shaded side is opposite the origin, but the boundary type makes the match invalid.

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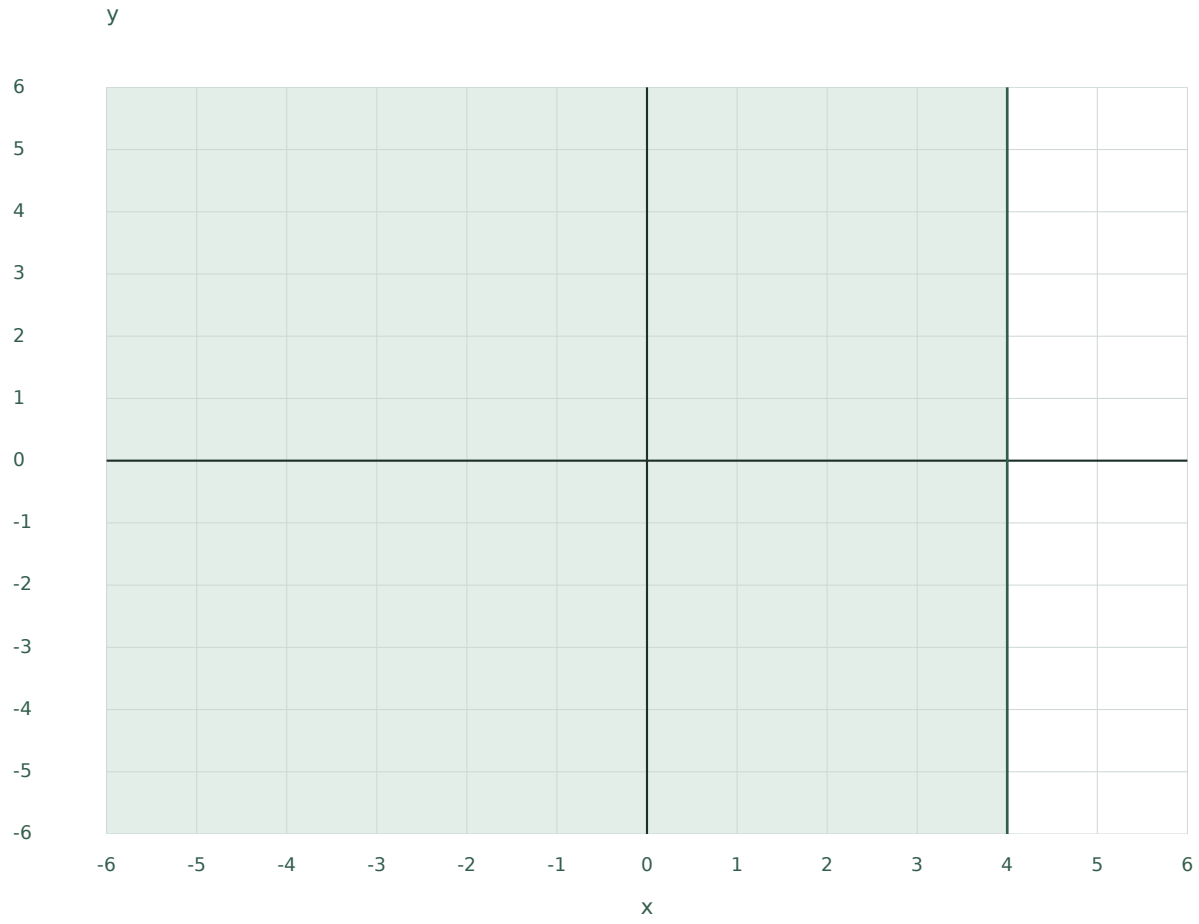
Task 1 / graph key



Given graph as described in the prompt. Decide whether its boundary style and shading match the separate inequality card.

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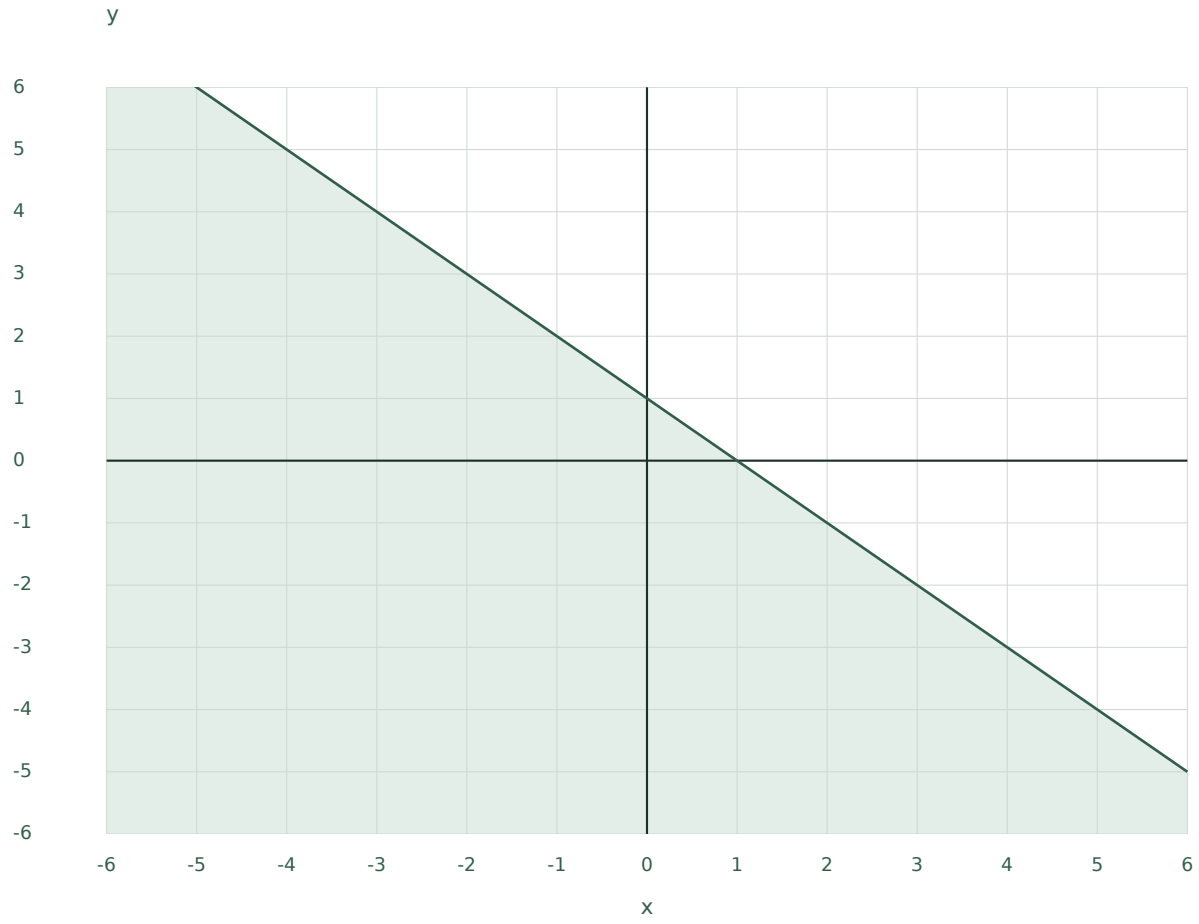
Task 2 / graph key



Given graph as described in the prompt. Decide whether its boundary style and shading match the separate inequality card.

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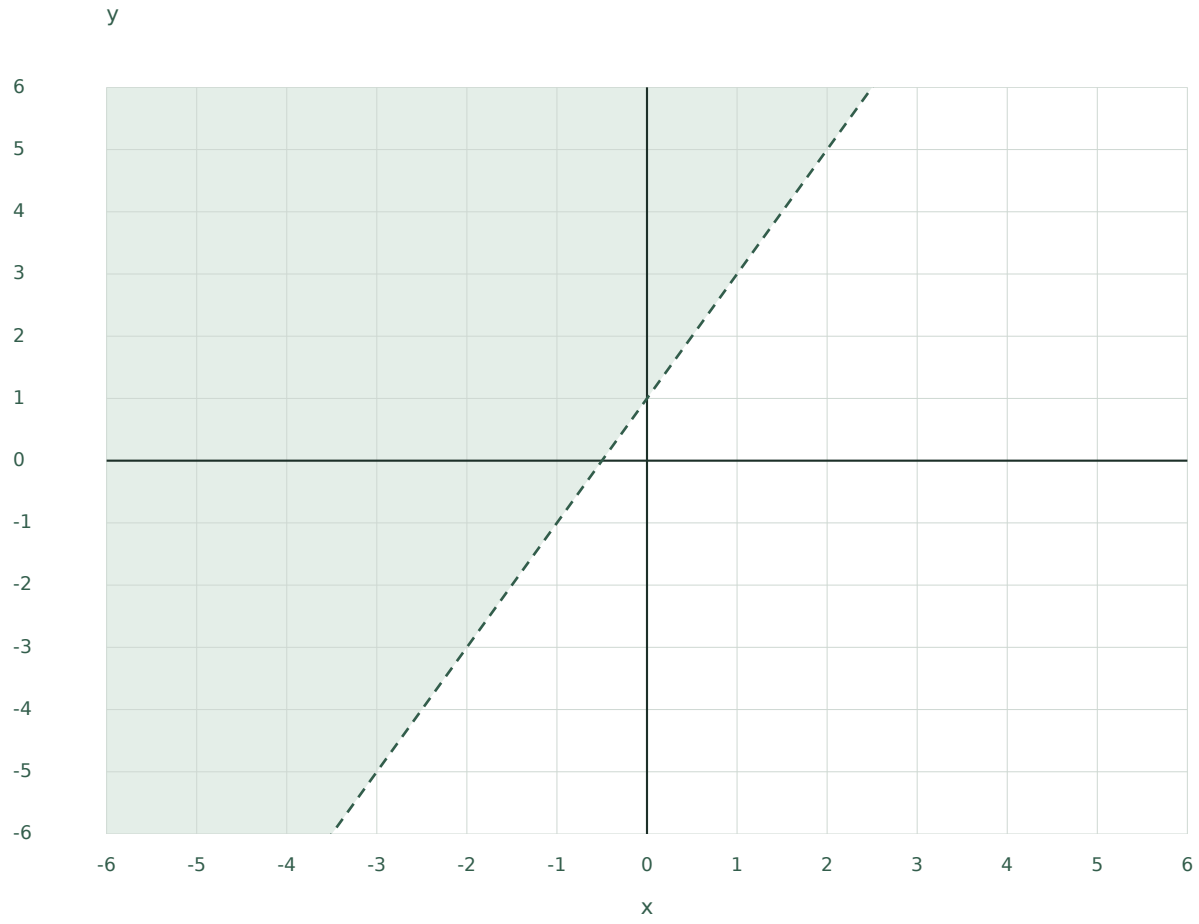
Task 3 / graph key



Given graph as described in the prompt. Decide whether its boundary style and shading match the separate inequality card.

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Task 4 / graph key



Given graph as described in the prompt. Decide whether its boundary style and shading match the separate inequality card.

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Source rubric / reflection

- [ ] Boundary line equation is identified correctly from the inequality.
- [ ] Boundary is marked dashed for strict symbols or solid for non-strict symbols.
- [ ] A test point not on the boundary is chosen and substituted correctly.
- [ ] The true or false result of the test is stated and used to justify the shaded side.
- [ ] The final match is supported by both boundary features and shading evidence.
- [ ] Hand-drawn notation clearly shows boundary type and shaded side, even if letter styles or x-height vary.
- [ ] Valid alternative notations, such as above/below labels or sample-point lists, are accepted when unambiguous.

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