Algebra Lab: Matching Graphs, Points, and Slopes

Original tasks 1, 2, 3 / complete keys

Task 1

Graph A passes through (0, 1) and (2, 5). Point card P reads (3, 7). Slope card S reads 2. Do these form a triple? Show both slope calculations.

Answer: Yes. Slope from (0, 1) to (2, 5) is (5 minus 1) divided by (2 minus 0) equals 4 divided by 2 equals 2. Check (3, 7) from (0, 1): (7 minus 1) divided by (3 minus 0) equals 6 divided by 3 equals 2. Both equal 2, so the triple matches.

Reason: Compute the graph slope from its two marked points, then recompute slope from one marked point to the candidate point. Equal values confirm the point lies on the line and the slope card is correct.

Check: Reverse the subtraction order in both coordinates; the slope should remain 2. Also confirm that 7 equals 1 plus 2 times 3.

Task 2

Graph B passes through (1, 6) and (3, 2). Point card Q reads (4, 0). Slope card T reads negative 2. Do these form a triple? Show both calculations.

Answer: Yes. Slope from (1, 6) to (3, 2) is (2 minus 6) divided by (3 minus 1) equals negative 4 divided by 2 equals negative 2. Check (4, 0) from (1, 6): (0 minus 6) divided by (4 minus 1) equals negative 6 divided by 3 equals negative 2. Both equal negative 2, so the triple matches.

Reason: A falling line has a negative slope. Keeping y-values in the same order in numerator and denominator preserves the sign.

Check: Verify that 0 equals 6 plus negative 2 times 3. Then confirm the graph falls from left to right.

Task 3

Graph C passes through (0, 0) and (4, 2). Point card R reads (6, 3). Slope card U reads one half. Do these form a triple? Show both calculations.

Answer: Yes. Slope from (0, 0) to (4, 2) is (2 minus 0) divided by (4 minus 0) equals 2 divided by 4 equals one half. Check (6, 3) from (0, 0): (3 minus 0) divided by (6 minus 0) equals 3 divided by 6 equals one half. Both equal one half, so the triple matches.

Reason: The slope is a fraction less than 1, so the line rises slowly. Equivalent fractions such as 2 fourths and 3 sixths both simplify to one half.

Check: Simplify both computed fractions and compare. Confirm that 3 equals 0 plus one half times 6.

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Original tasks 4 / complete keys

Task 4

Graph D passes through (2, 5) and (5, 11). Point card V reads (8, 17). Slope card W reads 2. Do these form a triple? Show both calculations.

Answer: Yes. Slope from (2, 5) to (5, 11) is (11 minus 5) divided by (5 minus 2) equals 6 divided by 3 equals 2. Check (8, 17) from (2, 5): (17 minus 5) divided by (8 minus 2) equals 12 divided by 6 equals 2. Both equal 2, so the triple matches.

Reason: Even though the coordinates are larger, the same rise-over-run procedure applies. The point check confirms the candidate lies on the same line.

Check: Confirm that 17 equals 5 plus 2 times 6. Also check that the graph's two marked points differ by 6 in y and 3 in x.

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Source rubric / reflection

- [ ] Triple is complete: one graph, one point, one slope, all used once.
- [ ] Slope calculation from two graph points is shown and correct.
- [ ] Point check uses the same slope value and is shown.
- [ ] Fractions are simplified or both forms are stated.
- [ ] Negative slopes and negative coordinates are handled with consistent subtraction order.
- [ ] Recording sheet is legible and each triple is justified by arithmetic, not appearance.

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