Sets & Steps
Math Practice & Worked Solutions

Algebra 1

Parallel Lines and Coincident Lines

Parallel Lines and Coincident Lines | A1-U05-P13

96 problems · Four activity formats

Topic focus

Across 96 tasks this topic asks for an exact line, point, parameter set, or justified verdict.

8 PDFs and a README; 48 buyer pages.

The following pages use the same questions, given data, and notation as the final files. Question/card serial numbers and internal IDs are omitted in this preview only. Table values and matching responses are retained. Full answer keys are not included.

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Algebra 1

Parallel Lines and Coincident Lines

Name: _____ **Date:** _____ **Class:** _____

Answer each question and record the matching bank letter. Give exact values. A value without its unit is not a complete answer.

Starting at $(-4, -2)$, travel -1 times the reference displacement $<2, 5>$. Give the resulting second point and account for the reversed orientation. Bank label: _____	The reference displacement $<0, 11>$ is vertical. From the new anchor $(17, -13)$, apply the multiple -2 and report a distinct second point with the same direction. Bank label: _____
The direction vector $<11, -4>$ moves right and downward along a reference line. Starting at $(2, 13)$, use the nonzero scale 2 to construct a second parallel-line point. Bank label: _____	Evidence: Line A passes through $(0, 1), (3, 7)$; line B passes through $(2, -4), (5, 2)$. Does this prove two distinct parallel lines, prove coincidence, or remain insufficient? Justify the strength of the givens. Bank label: _____
Evidence: A diagram marks both lines vertical at $x = -2$ and $x = 5$. Does this prove two distinct parallel lines, prove coincidence, or remain insufficient? Justify the strength of the givens. Bank label: _____	For which real t is $y = 2x + t$ a distinct line parallel to $y = 2x + 3$? State the excluded value and why. Bank label: _____
To make a line parallel to $y = 3x + 1$ through $(2, 5)$, a student uses slope $-\frac{1}{3}$ and writes $y - 5 = -\frac{1}{3}(x - 2)$. Diagnose the direction error. Bank label: _____	Classify the exact lines $y - 7 = \frac{1}{2}(x + 2)$ and $2x + y = -3$ as distinct parallel, coincident, or nonparallel. Justify direction and location separately. Bank label: _____

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Answer each question and show your reasoning in the workspace. Give exact values rather than decimals unless the question supplies a decimal. A value without its unit is not a complete answer.

Construct a line through $(14, 12)$ parallel to the reference $19x - 14y = 98$, and require it to be distinct. If the requirement is impossible, explain why.	Construct a line through $(-6, -3)$ parallel to the reference $y = 0x + 5$, and require it to be distinct. If the requirement is impossible, explain why.
Classify the exact lines $y = -x + 3$ and $y = -x + 3$ as distinct parallel, coincident, or nonparallel. Justify direction and location separately.	Construct a line through $(-24, 38)$ parallel to the reference $y = -\frac{29}{24}x + 8$, and require it to be distinct. If the requirement is impossible, explain why.
Classify the exact lines $y = 2x + 1$ and $y = 2x + 5$ as distinct parallel, coincident, or nonparallel. Justify direction and location separately.	For which real t is $y = \frac{13}{9}x + t$ a distinct line parallel to $y = \frac{13}{9}x + \frac{17}{6}$? State the excluded value and why.

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Begin at START. Answer the card, then find the matching final answer at the top of another card. Use the recording sheet for your reasoning. Visit each card once and continue to FINISH.

Incoming: $y - \frac{37}{9} = \frac{4}{9}(x + 2)$ versus $16x - 36y = -180$: coincident. Starting at $(-7, -6)$, travel -1 times the reference displacement $\langle 5, 12 \rangle$. Give the resulting second point and account for the reversed orientation. Your response: _____	**Incoming:** The second point is $(-12, -18)$, from displacement $\langle -5, -12 \rangle$ applied to $(-7, -6)$. Construct a line through $(10, 9)$ parallel to the reference $y + \frac{1}{5} = \frac{2}{5}(x + 3)$, and require it to be distinct. If the requirement is impossible, explain why. Your response: _____
Incoming: $y - \frac{1}{2} = \frac{7}{12}(x + 2)$ versus $7x - 12y = 33$: distinct parallel. Classify the exact lines $y - \frac{37}{9} = \frac{4}{9}(x + 2)$ and $16x - 36y = -180$ as distinct parallel, coincident, or nonparallel. Justify direction and location separately. Your response: _____	**Incoming:** The second point is $(30, 1)$, from displacement $\langle 27, 6 \rangle$ applied to $(3, -5)$. A reference line moves left 9 and up 7. From $(-10, -3)$, scale that signed displacement by 3 to locate another point on a parallel line. Your response: _____
Incoming: The second point is $(15, -24)$, from displacement $\langle 7, -15 \rangle$ applied to $(8, -9)$. Classify the exact lines $y + \frac{25}{2} = \frac{9}{4}(x + 2)$ and $9x - 4y = -12$ as distinct parallel, coincident, or nonparallel. Justify direction and location separately. Your response: _____	**Incoming:** t = $\frac{8}{7}$; the normal coefficients use scale $-\frac{2}{7}$, but the constant 14 is not $-\frac{18}{7}$, so the lines are distinct. Reference line: $y = 2x + 1$. Candidate: $y = (3t - 1)x + 5$. Find t so the candidate is distinct and parallel. Your response: _____

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Evaluate the supplied statement or method. Say whether it is correct, repair it if it is not, and verify the result exactly. Not every prompt contains an error.

Choose and justify a method before solving (compare slopes, use proportional direction vectors, or construct through the required point). Then complete the task: Evidence: A uses points $(-4, 6), (2, -3)$. B uses points $(8, -9), (12, -15)$. Does this prove two distinct parallel lines, prove coincidence, or remain insufficient? Justify the strength of the givens.

Choose and justify a method before solving (compare slopes, use proportional direction vectors, or construct through the required point). Then complete the task: Evidence: A is horizontal through $(0, 4)$. B has two points $(-5, -2), (6, -2)$. Does this prove two distinct parallel lines, prove coincidence, or remain insufficient? Justify the strength of the givens.

Choose and justify a method before solving (compare slopes, use proportional direction vectors, or construct through the required point). Then complete the task: Evidence: Line A has slope $\frac{5}{3}$. Line B rises 10 coordinate units over a run of 6, with a point not on A. Does this prove two distinct parallel lines, prove coincidence, or remain insufficient? Justify the strength of the givens.

A student claims $y = 0$ and $x = 5$ are parallel because both have a zero coefficient. Diagnose the comparison.

Parallel Lines and Coincident Lines

Full Worked Solutions - excerpt

Worked example

Problem. Starting at $(-4, -2)$, travel -1 times the reference displacement $< 2, 5 >$. Give the resulting second point and account for the reversed orientation.

Answer. The second point is $(-6, -7)$, from displacement $< -2, -5 >$ applied to $(-4, -2)$.

Explanation and check.

A negative multiplier reverses the reference orientation but preserves the parallel direction. Add the reversed vector to the anchor.

Worked example

Problem. The reference displacement $< 0, 11 >$ is vertical. From the new anchor $(17, -13)$, apply the multiple -2 and report a distinct second point with the same direction.

Answer. The second point is $(17, -35)$, from displacement $< 0, -22 >$ applied to $(17, -13)$.

Explanation and check.

Scaling a vector with zero horizontal component keeps the x-coordinate fixed while changing y by a nonzero amount.