

MATTHIE ASSESSMENT

Mastery-Based Math Resources

Matthie Recalculation Path

Algebra: A Complete Course (Book 2)

Student Forms

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AL-EX-01

Form AL-EX-01-RF1

Name: _____ Grade: _____ Date: _____

Route Finder

Simplify: $3x + 5$

Tripwire

Simplify: $x + 3x$

AL-EX-01 (continued)

Form AL-EX-01-CF1

Name: _____ Grade: _____ Date: _____

Confirmation

A student is asked to simplify $9y - y$ and says $9y - y = 9$ (treating y as if it disappears). Is this correct?

Road Test

A recipe uses 2 cups of flour plus 5 more cups of flour, written as an expression: $2c + 5c$. Simplify it, in a baking context with no algebra vocabulary used.

AL-EX-02

Form AL-EX-02-RF1

Name: _____ Grade: _____ Date: _____

Route Finder

Simplify: $5 - (x - 3)$

Tripwire

Simplify: $8 - (3x - 2)$

AL-EX-02 (continued)

Form AL-EX-02-CF1

Name: _____ Grade: _____ Date: _____

Confirmation

Simplify $12 - (5x - 7)$ and check your answer by substituting $x = 1$ into both the original and your simplified form.

Road Test

A budget note reads: starting balance 20, minus (a withdrawal of $6x$, minus a refund of 4). Write this as a simplified expression, with no mention of brackets or distribution.

AL-EX-03

Form AL-EX-03-RF1

Name: _____ Grade: _____ Date: _____

Route Finder

Can ' $4x + 7$ ' be solved for x ? Explain.

Tripwire

Translate "5 less than n " into an algebraic expression.

AL-EX-03 (continued)

Form AL-EX-03-CF1

Name: _____ Grade: _____ Date: _____

Confirmation

Is ' $3x - 5 = 10$ ' an expression or an equation? Can it be 'solved'? What about ' $3x - 5$ '?

Road Test

A note says “7 less than twice a number,” with no instruction to translate it in a particular order.

AL-EX-04

Form AL-EX-04-RF1

Name: _____ Grade: _____ Date: _____

Route Finder

Evaluate $3x + 2$ when $x = 4$.

Tripwire

Evaluate x^2 when $x = -5$.

AL-EX-04 (continued)

Form AL-EX-04-CF1

Name: _____ Grade: _____ Date: _____

Confirmation

Evaluate $3x^2$ when $x = -2$, showing the bracket step.

Road Test

A ball's height is given by $5 - t^2$ at t seconds. Find the height when $t = -3$, phrased as a physics question with no substitution instructions given.

AL-EX-05

Form AL-EX-05-RF1

Name: _____ Grade: _____ Date: _____

Route Finder

Find the value of $2x + 1$ when $x = 3$, and again when $x = 10$.

Tripwire

A cost expression evaluates to 35. What should the full answer include besides the number?

AL-EX-05 (continued)

Form AL-EX-05-CF1

Name: _____ Grade: _____ Date: _____

Confirmation

A taxi cost is $4 + 2m$ dollars for m minutes. Evaluate at $m = 10$ and $m = 20$. Is the cost fixed?

Road Test

A phone plan is described only as ' $10 + 0.05t$ ' with t being texts sent, and someone asks what the plan costs for 50 texts, with no units mentioned in the question.

AL-EQ-01

Form AL-EQ-01-RF1

Name: _____ Grade: _____ Date: _____

Route Finder

Solve: $x + 5 = 12$

Tripwire

Solve: $-3x = 12$

AL-EQ-01 (continued)

Form AL-EQ-01-CF1

Name: _____ Grade: _____ Date: _____

Confirmation

Solve $-5x = -15$, and identify the inverse operation used.

Road Test

A scale shows a mystery weight plus 7 kg balances at 12 kg, written as $w + 7 = 12$ in a science context with no equation-solving instructions.

AL-EQ-02

Form AL-EQ-02-RF1

Name: _____ Grade: _____ Date: _____

Route Finder

You solved $x - 8 = 15$ and got $x = 23$. Verify.

Tripwire

Solve $-3x = 12$, then verify your answer by substituting it back in.

AL-EQ-02 (continued)

Form AL-EQ-02-CF1

Name: _____ Grade: _____ Date: _____

Confirmation

A classmate solves $2x = -18$ and gets $x = -9$, then says checking is unnecessary since the steps were easy. Respond.

Road Test

Someone calculates that a value of 6 solves $x - 10 = -4$, and wants to know if that's right, with no verification method suggested.

AL-EQ-03

Form AL-EQ-03-RF1

Name: _____ Grade: _____ Date: _____

Route Finder

Solve: $2(x - 4) = 10$

Tripwire

Solve: $2(x - 4) = 10$

AL-EQ-03 (continued)

Form AL-EQ-03-CF1

Name: _____ Grade: _____ Date: _____

Confirmation

Solve $4(x - 2) = 20$ using both methods (distribute first, and divide by 4 first). Do they agree?

Road Test

A rectangle's perimeter is modeled as $2(x + 5) = 26$, presented as a geometry problem with no algebra-method instructions.

AL-EQ-04

Form AL-EQ-04-RF1

Name: _____ Grade: _____ Date: _____

Route Finder

Solve: $2x + 3 = 2x + 3$

Tripwire

Solve $2x + 3 = 2x + 3 - 3x + 3x$. What does the result mean?

AL-EQ-04 (continued)

Form AL-EQ-04-CF1

Name: _____ Grade: _____ Date: _____

Confirmation

Solve $5x - 2 = 5x + 3$. What does the result mean?

Road Test

Two phone plans are modeled as $20 + 0.1m$ and $20 + 0.1m$ for m minutes, and someone asks when the plans cost the same, with no mention of equation types.

AL-IN-01

Form AL-IN-01-RF1

Name: _____ Grade: _____ Date: _____

Route Finder

Solve: $-2x > 8$

Tripwire

Solve: $-4x > 20$

AL-IN-01 (continued)

Form AL-IN-01-CF1

Name: _____ Grade: _____ Date: _____

Confirmation

Solve $-5x \geq -25$, and state whether the sign flips.

Road Test

A note says a temperature change of -2 degrees per hour times some number of hours is at most -10 degrees total, written as $-2h \leq -10$ with no inequality-solving instructions.

AL-IN-02

Form AL-IN-02-RF1

Name: _____ Grade: _____ Date: _____

Route Finder

Graph $x \geq 5$ in words: open or closed circle, which direction?

Tripwire

Graph $x < -2$. Which direction does the arrow point, and why?

AL-IN-02 (continued)

Form AL-IN-02-CF1

Name: _____ Grade: _____ Date: _____

Confirmation

Graph $x \leq -3$ in words, and state one value that should be included and one that shouldn't.

Road Test

A parking garage charges by the hour, and a sign states a driver can stay for at most 6 hours, modeled as $h \leq 6$, with no graphing instructions given.

AL-LN-01

Form AL-LN-01-RF1

Name: _____ Grade: _____ Date: _____

Route Finder

Identify the slope and y-intercept of $y = 3x - 2$.

Tripwire

Find the slope and y-intercept of $y = -x + 4$.

AL-LN-01 (continued)

Form AL-LN-01-CF1

Name: _____ Grade: _____ Date: _____

Confirmation

Identify the slope and y-intercept of $y = x - 9$.

Road Test

A cost model is written as $C = -n + 50$ with no slope/intercept language used, and someone asks how the cost changes per unit.

AL-LN-02

Form AL-LN-02-RF1

Name: _____ Grade: _____ Date: _____

Route Finder

Find the slope through (1, 2) and (5, 10).

Tripwire

A line passes through (2,5) and (6,5). Another passes through (3,1) and (3,8). Find both slopes and describe each line.

AL-LN-02 (continued)

Form AL-LN-02-CF1

Name: _____ Grade: _____ Date: _____

Confirmation

Find the slope through (0, 4) and (0, -2). What kind of line is this?

Road Test

Two delivery routes are compared using coordinate pairs (1,3)-(1,9) and (2,4)-(8,4), with no mention of slope in the question.

AL-LN-03

Form AL-LN-03-RF1

Name: _____ Grade: _____ Date: _____

Route Finder

Write the equation of a line with slope 4 through the point (1, 5).

Tripwire

Write the point-slope equation for a line with slope 5 through (2, -3), then simplify.

AL-LN-03 (continued)

Form AL-LN-03-CF1

Name: _____ Grade: _____ Date: _____

Confirmation

Write the point-slope equation for a line with slope -3 through (-2, -5), then simplify.

Road Test

A line on a graph passes through the point (5, -1) and rises 2 units for every 1 unit right, phrased with no mention of slope or point-slope form.

AL-LN-04

Form AL-LN-04-RF1

Name: _____ Grade: _____ Date: _____

Route Finder

A line has slope 3. What is the slope of a line perpendicular to it?

Tripwire

A line has slope 4. Find the slope of a line perpendicular to it.

AL-LN-04 (continued)

Form AL-LN-04-CF1

Name: _____ Grade: _____ Date: _____

Confirmation

A line has slope $-\frac{5}{6}$. Find the perpendicular slope, and verify using the product rule.

Road Test

Two hiking trails cross at a right angle; one has a steepness ratio of 3 (rise over run), and someone asks for the other trail's steepness ratio, with no perpendicular-slope language used.

AL-SY-01

Form AL-SY-01-RF1

Name: _____ Grade: _____ Date: _____

Route Finder

Solve by substitution: $y = x - 3$ and $2x - y = 7$

Tripwire

Solve by substitution: $y = x - 3$ and $2x - 4y = 10$

AL-SY-01 (continued)

Form AL-SY-01-CF1

Name: _____ Grade: _____ Date: _____

Confirmation

Solve by elimination: $3x + y = 11$ and $x - y = 1$.

Road Test

Two friends' combined ages and age difference are given as $x + y = 30$ and $x - y = 4$, in a word-problem context with no method specified.

AL-SY-02

Form AL-SY-02-RF1

Name: _____ Grade: _____ Date: _____

Route Finder

Solve the system $x + y = 7$ and $x - y = 3$, and state the solution.

Tripwire

Solve the system $3x + y = 7$ and $6x + 2y = 15$. What does the result mean?

AL-SY-02 (continued)

Form AL-SY-02-CF1

Name: _____ Grade: _____ Date: _____

Confirmation

Solve the system $x - y = 4$ and $2x - 2y = 9$. What does the result mean?

Road Test

Two pricing plans are compared and the algebra leads to $6 = 6$ with both variables gone, in a business context with no system-of-equations language used.

AL-PL-01

Form AL-PL-01-RF1

Name: _____ Grade: _____ Date: _____

Route Finder

Simplify: $(5x^2 + 3x) - (2x^2 + x)$

Tripwire

Simplify: $(4x^2 - 3x) - (x^2 + 5x)$

AL-PL-01 (continued)

Form AL-PL-01-CF1

Name: _____ Grade: _____ Date: _____

Confirmation

Simplify: $(2x^2 - x + 6) - (5x^2 - 3x - 2)$

Road Test

Two account balances are modeled as polynomials, and someone asks for the difference between them, in a finance context with no polynomial-subtraction instructions given.

AL-PL-02

Form AL-PL-02-RF1

Name: _____ Grade: _____ Date: _____

Route Finder

Expand: $(x + 3)(x + 4)$

Tripwire

Expand: $(x + 5)^2$

AL-PL-02 (continued)

Form AL-PL-02-CF1

Name: _____ Grade: _____ Date: _____

Confirmation

Expand $(x - 3)(x + 8)$, showing all four products.

Road Test

A garden's area is modeled as $(x + 4)$ times $(x + 4)$ for a square plot, with no binomial-expansion language used.

AL-PL-03

Form AL-PL-03-RF1

Name: _____ Grade: _____ Date: _____

Route Finder

Factor completely: $2x^2 + 10x + 12$

Tripwire

Factor completely: $2x^2 + 10x + 12$

AL-PL-03 (continued)

Form AL-PL-03-CF1

Name: _____ Grade: _____ Date: _____

Confirmation

Factor completely: $4x^2 + 20x + 24$

Road Test

An area model shows $5x^2 + 25x + 30$ square units and asks for its factored dimensions, with no GCF language used.

AL-PL-04

Form AL-PL-04-RF1

Name: _____ Grade: _____ Date: _____

Route Finder

Factor $x^2 - 16$, then verify by expanding.

Tripwire

Factor $x^2 + 25$ if possible. Explain your answer.

AL-PL-04 (continued)

Form AL-PL-04-CF1

Name: _____ Grade: _____ Date: _____

Confirmation

Factor $x^2 - 100$ if possible, then check by expanding. Can $x^2 + 100$ be factored the same way?

Road Test

A student claims two square rooms, one $x^2 - 36$ and one $x^2 + 36$ in area, can both be split into equal factor pairs the same way, with no sum/difference vocabulary used.
