Algebra 1 Final Exam (Mock)

Time: 120 minutes
Instructions: Show all work. Calculator optional.

Part A: Linear Equations & Inequalities (8 pts)

Solve for x: -3x + 7 = 19

Solve and graph on a number line: 5x - 4 ≤ 11

Write the equation of a line with slope m = -2/3 and passing through (6, 5).

A cell phone plan charges $40/month plus $0.05 per text. Write a linear equation for the monthly cost C in terms of number of texts t.

Part B: Graphing (6 pts)

Graph y = 2x - 3. Label the slope and y-intercept.

The line y = -x + 4 is given. Write an equation of the line parallel to it through the point (2, 1).

Are the lines y = 1/2x + 3 and y = -2x - 1 parallel, perpendicular, or neither?

Part C: Systems of Equations (6 pts)

Solve by substitution: y = 2x + 3 and 3x + y = 9

Solve by elimination: 2x + 3y = 12 and 4x - 3y = 6

A concert sold 120 tickets for a total of $720. Adult tickets were $8, student tickets were $4. How many of each were sold?

Part D: Exponents & Polynomials (6 pts)

Simplify: (2x^3)(-3x^2)

Simplify: (4x^2y^3)^2

Expand: (x - 5)(x + 7)

Factor completely: x^2 - 9x + 20

Part E: Quadratics (6 pts)

Solve: x^2 - 6x + 8 = 0

Solve by completing the square: x^2 + 4x - 5 = 0

A ball is thrown upward with height given by h(t) = -5t^2 + 20t + 3. What is the maximum height? At what time does it occur?

Part F: Radicals & Rational Expressions (6 pts)

Simplify: √50

Simplify: (x^2 - 9)/(x^2 - 3x)

Rationalize the denominator: 5/√7

Part G: Word Problems & Functions (7 pts)

A car rental costs $25 per day plus $0.20 per mile. Write a linear function for cost C(d,m), where d = days, m = miles.

A company's profit is given by P(x) = -2x^2 + 40x - 96. What number of items x maximizes profit? What is the maximum profit?

Is the relation {(2,5), (3,7), (4,9), (2,6)} a function? Explain.

Find the slope of the line between points (-3, 2) and (4, -5).

A sequence is defined by a■ = 3n - 1. Write the first 5 terms.

Grading

• 25 questions, ~2–3 pts each.
• Passing mastery: 80%+ (20/25 correct).
• If you fall below that in one category, review that section before moving forward.