

Solving Linear Equations and Rearranging Formulas

Grade 9 – Algebra 1 math · Worksheet · Standards: A-REI.A.1, A-REI.B.3, A-CED.A.1, A-CED.A.4

Name: _____ Date: _____ Class: _____

These problems build fluency with multi-step linear equations, from one-step checks to variables on both sides, fractions and decimals. They address standards A-REI.A.1 and A-REI.B.3, including justifying steps and spotting equations with no solution. The final problems write equations from word situations and solve formulas for one letter (A-CED.A.1 and A-CED.A.4), so keep the units attached and check each answer.

Standards: A-REI.A.1, A-REI.B.3, A-CED.A.1, A-CED.A.4 · **Level:** Grade 9 Algebra 1

Problem 1 One-step plus one (easy)

Solve $7x - 4 = 38$.

Problem 2 Distribute and solve (easy)

Solve $5(x - 3) = 35$.

Problem 3 A fraction on the variable (easy)

Solve $\frac{x}{4} + 3 = 8$.

Problem 4 Negative coefficient (easy)

Solve $9 - 2x = -7$.

Problem 5 Justify each step (easy)

Solve $4x - 7 = 21$, and write the property that justifies each step.

$$4x - 7 = 21 \text{ given}$$

$$4x = 28 ?$$

$$x = 7 ?$$

Name the reason for each step.

Problem 6 Variables on both sides (medium)

Solve $5x - 8 = 2x + 19$.

Problem 7 Distribute on the left (medium)

Solve $3(2x - 1) = 4x + 9$.

Problem 8 Fraction coefficient (medium)

Solve $\frac{5}{6}x - 4 = 21$.

Problem 9 Fractions on both sides (medium)

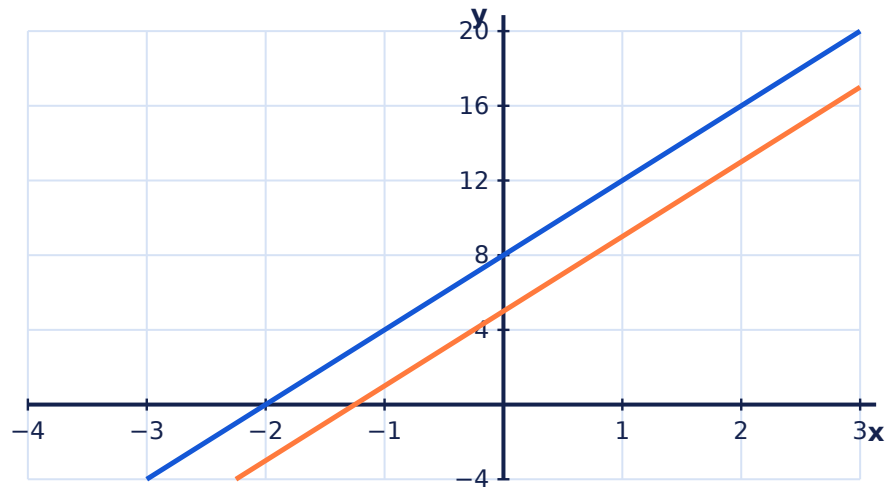
Solve $\frac{(x+5)}{4} = \frac{(x-1)}{2}$.

Problem 10 Decimal equation (medium)

Solve $0.4x + 1.5 = 0.15x + 4$.

Problem 11 No solution (medium)

Solve $4(x + 2) = 4x + 5$. The graph shows both sides.



Left side $y = 4(x + 2)$ in blue, right side $y = 4x + 5$ in orange.

Problem 12 Every number works (medium)

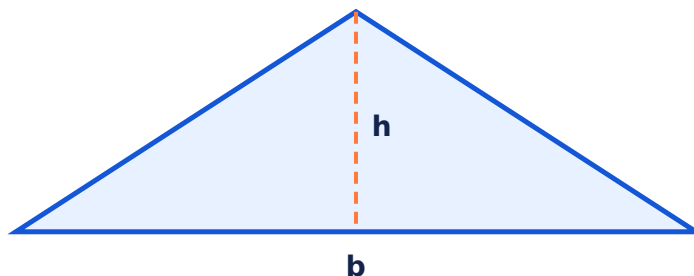
Solve $10x + 15 = 5(2x + 3)$.

Problem 13 Find the error (medium)

A student solved $5(x - 2) = 3x + 6$ and wrote $5x - 2 = 3x + 6$ in the first step. Describe the error and solve correctly.

Problem 14 Triangle area formula (medium)

Solve $A = \frac{1}{2}bh$ for h .



A triangle with base b and height h .

Problem 15 Comparing gym plans (hard)

Gym A charges \$25 to join plus \$12 each month. Gym B charges \$40 to join plus \$9 each month. After how many months is the total cost the same?

Problem 16 Taxi fare (hard)

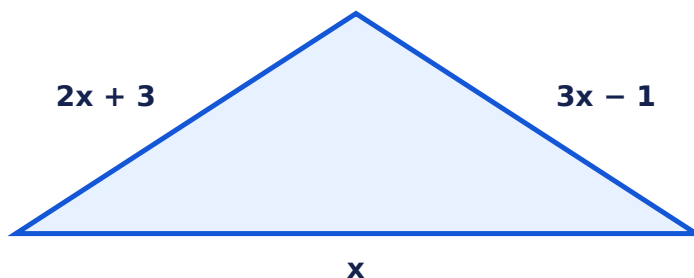
A taxi charges \$3.50 plus \$2.25 per mile. Write an equation and find how many miles are in a \$21.50 fare.

Problem 17 Temperature formula (hard)

Solve $F = \frac{9}{5}C + 32$ for C , then find C when $F = 95$.

Problem 18 Perimeter of a triangle (hard)

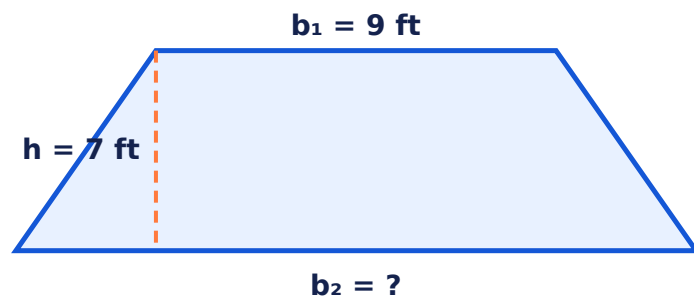
The perimeter of the triangle is 62 inches. Find x and all three side lengths.



Perimeter 62 inches.

Problem 19 Missing base of a trapezoid (hard)

A trapezoid has area $A = \frac{1}{2}h(b_1 + b_2)$. Solve for b_2 , then find b_2 when $A = 84$, $h = 7$ and $b_1 = 9$.



Area 84 square feet.

Problem 20 Robotics fundraiser (hard)

A robotics club needs \$1,260. It already has \$245 and earns \$35 profit on each kit it sells. Write an equation and find the number of kits needed.