

# Solving Linear Equations and Rearranging Formulas

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

Name: \_\_\_\_\_ Date: \_\_\_\_\_ Class: \_\_\_\_\_

This test has 9 questions worth 20 points in total. Show every step, check solutions where asked, and write final answers with units for word problems. A calculator is allowed. Plan on about 45 minutes.

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

Time: 45 minutes · 9 questions · Total: 20 points · Calculator: as allowed by your teacher

## Question 1 Variables on both sides (2 points)

Solve  $8x - 13 = 3x + 22$  and check your answer.

## Question 2 Distribute and combine (2 points)

Solve  $2(3x - 4) - 5 = 15 - x$ .

## Question 3 Equation with fractions (2 points)

Solve  $\frac{x}{3} - \frac{1}{2} = \frac{5}{6}$ .

## Question 4 Justify the steps (2 points)

Solve  $5x + 9 = 3x - 7$ . Write the property that justifies each step.

## Question 5 Number of solutions (2 points)

Decide how many solutions each equation has. Show your work. (a)  $3(2x + 5) = 6x + 11$  (1 point) (b)  $4(x - 2) = 2(2x - 4)$  (1 point)

## Question 6 Moving company (3 points)

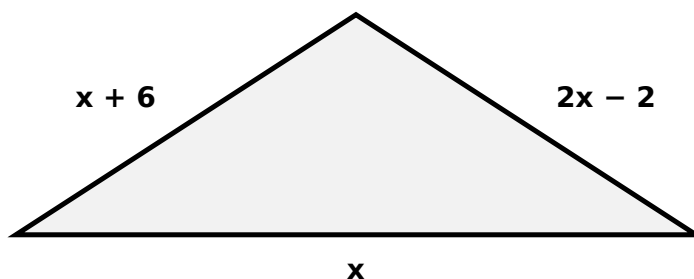
Mover A charges \$90 plus \$35 per hour. Mover B charges \$50 plus \$45 per hour. (a) Write an equation that says the two costs are equal. (1 point) (b) Solve it. (1 point) (c) Find the cost at that time. (1 point)

## Question 7 Pyramid volume formula (3 points)

The volume of a pyramid is  $V = \frac{1}{3}Bh$ . (a) Solve for  $h$ . (2 points) (b) Find  $h$  when  $V = 96$  and  $B = 36$ . (1 point)

### Question 8 Perimeter of a triangle (2 points)

The perimeter of the triangle is 40 cm. Find  $x$  and the three side lengths.



*Perimeter 40 centimeters.*

### Question 9 Simple interest (2 points)

Use the formula to solve for the rate.

Simple interest:  $I = P r t$

$I$  = interest earned,  $P$  = amount invested,

$r$  = yearly rate (decimal),  $t$  = years

*Interest formula.*

(a) Solve for  $r$ . (1 point) (b) Find  $r$  as a percent when  $I = 135$ ,  $P = 1,500$  and  $t = 3$ . (1 point)