

Solving Linear Equations and Rearranging Formulas

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

Use this answer key to score the test. Award partial credit for correct setups even when the arithmetic slips, and accept equivalent forms of a rearranged formula.

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

Question 1 Variables on both sides (2 points)

$5x - 13 = 22$, so $5x = 35$ and $x = 7$.

Check: $8(7) - 13 = 43$ and $3(7) + 22 = 43$.

$x = 7$

Scoring: 1 point for correct algebra, 1 point for the answer with a check.

Question 2 Distribute and combine (2 points)

$6x - 8 - 5 = 15 - x$, so $6x - 13 = 15 - x$.

$7x = 28$, so $x = 4$.

Check: $2(8) - 5 = 11$ and $15 - 4 = 11$.

$x = 4$

Scoring: 1 point for distributing and combining like terms, 1 point for the solution.

Question 3 Equation with fractions (2 points)

Multiply every term by 6: $2x - 3 = 5$. Then $2x = 8$ and $x = 4$.

Check: $4/3 - 1/2 = 8/6 - 3/6 = 5/6$.

$x = 4$

Scoring: 1 point for clearing fractions, 1 point for the solution.

Question 4 Justify the steps (2 points)

$$5x + 9 = 3x - 7 \text{ (given)}$$

$$2x + 9 = -7 \text{ (subtraction property of equality: subtract } 3x\text{)}$$

$$2x = -16 \text{ (subtraction property: subtract } 9\text{)}$$

$$x = -8 \text{ (division property of equality: divide by } 2\text{)}$$

$$\mathbf{x = -8}$$

Scoring: 1 point for the solution, 1 point for correct reasons.

Question 5 Number of solutions (2 points)

(a) $6x + 15 = 6x + 11$ gives $15 = 11$, false: **no solution**.

(b) $4x - 8 = 4x - 8$ is always true: **infinitely many solutions**.

Scoring: 1 point per part.

Question 6 Moving company (3 points)

(a) $90 + 35h = 50 + 45h$.

(b) $40 = 10h$, so $h = 4$.

(c) $90 + 35(4) = 230$.

4 hours; \$230

Scoring: 1 point per part.

Question 7 Pyramid volume formula (3 points)

(a) Multiply by 3: $3V = Bh$. Divide by B : $h = 3V/B$.

(b) $h = 3(96)/36 = 288/36 = 8$.

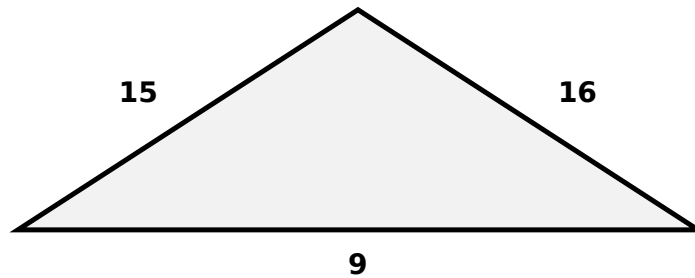
$$\mathbf{h = 3V/B; h = 8}$$

Scoring: (a) 1 point for multiplying by 3, 1 for dividing by B ; (b) 1 point.

Question 8 Perimeter of a triangle (2 points)

$x + (x + 6) + (2x - 2) = 40$, so $4x + 4 = 40$ and $x = 9$.

Sides: 9, 15, 16.



Sides 9, 15 and 16 add to 40.

$x = 9$; sides 9, 15, 16 cm

Scoring: 1 point for the equation and x , 1 point for all sides.

Question 9 Simple interest (2 points)

(a) Divide both sides by Pt : $r = I/(Pt)$.

(b) $r = 135/(1,500 \times 3) = 135/4,500 = 0.03 = 3\%$.

$r = I/(Pt)$; 3%

Scoring: 1 point per part.