

Solving Systems of Linear Equations Three Ways

Grade 9 – Algebra 1 math · Test Answer Key · Standards: A-REI.C.5, A-REI.C.6, A-REI.D.11, A-CED.A.3

Use this answer key to score the test. Accept any valid method, and award method points when the setup is correct even if the arithmetic has one slip.

Standards: A-REI.C.5, A-REI.C.6, A-REI.D.11, A-CED.A.3 · **Level:** Grade 9 Algebra 1

Question 1 Is it a solution? (2 points)

First: $2(4) + (-3) = 5$ ✓. Second: $4 - 3(-3) = 4 + 9 = 13$ ✓.

Yes

Scoring: 1 point for each equation checked.

Question 2 Substitution (2 points)

$4x + (3x - 2) = 12$, so $7x = 14$ and $x = 2$. Then $y = 3(2) - 2 = 4$.

Check: $8 + 4 = 12$ ✓.

(2, 4)

Scoring: 1 point for the substituted equation, 1 point for the pair.

Question 3 Elimination (2 points)

Add: $8x = 24$, so $x = 3$. Then $15 + 4y = 7$ gives $y = -2$.

Check: $9 + 8 = 17$ ✓.

(3, -2)

Scoring: 1 point for x , 1 point for y .

Question 4 Elimination with scaling (3 points)

Multiply the first by 4 and the second by 3: $8x + 12y = 76$ and $15x - 12y = 39$. Add: $23x = 115$, so $x = 5$.

Then $10 + 3y = 19$ gives $y = 3$.

Check: $25 - 12 = 13$ ✓.

(5, 3)

Scoring: 1 point for scaling correctly, 1 point for x, 1 point for y.

Question 5 Number of solutions (2 points)

(a) The second equation gives $y = -3x + 6$, the same line: **infinitely many solutions**.

(b) Same slope 4, different intercepts: parallel lines, **no solution**.

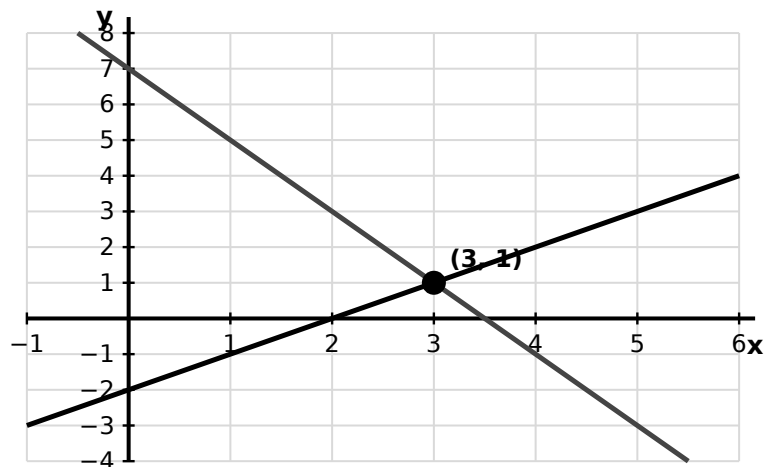
Scoring: 1 point per part.

Question 6 Solution from a graph (3 points)

(a) The lines cross at $(3, 1)$.

(b) $y = x - 2$: $3 - 2 = 1$ ✓. $y = -2x + 7$: $-6 + 7 = 1$ ✓.

(c) The outputs are equal at input $x = 3$, and the common output is 1.



The lines cross at $(3, 1)$.

(3, 1)

Scoring: 1 point per part.

Question 7 Concession stand (3 points)

(a) $3h + 2s = 15$ and $2h + 3s = 13.75$.

(b) Multiply by 3 and 2: $9h + 6s = 45$ and $4h + 6s = 27.5$. Subtract: $5h = 17.5$, so $h = 3.50$. Then $2s = 15 - 10.5 = 4.5$, so $s = 2.25$.

(c) $3.50 + 2.25 = 5.75$.

Hot dog \$3.50, soda \$2.25, together \$5.75

Scoring: 1 point per part.

Question 8 Comparing plans (3 points)

(a) $15 + 4h = 3 + 7h$.

(b) $12 = 3h$, so $h = 4$. The cost is 31 dollars for both.

(c) Plan A: $15 + 24 = 39$. Plan B: $3 + 42 = 45$. Plan A is cheaper.

h = 4 hours; Plan A for 6 hours

Scoring: 1 point per part.