

Systems of Linear Equations

Grade 8 Algebra

Easy · Medium · Hard

60 Scaffolded Sets · 1,200+ Problems

Complete Answer Keys for Every Set

CCSS-Aligned 8.EE.C.8

No-Prep · Print-Ready · Black & White Friendly

Focus Math Press

Goal

- Find the ordered pair **(x, y)** that makes **both** equations true.
- At this level, solutions are integers — check by substituting back into each equation.

Method 1: Substitution

- Solve one equation for **x** or **y**.
- Substitute that expression into the other equation and solve for one variable.
- Substitute back to find the second variable.

Worked example (Easy):

Eq. 1: $x + y = 5$

Eq. 2: $2x - y = 1$

From eq. 1: $y = 5 - x$. Substitute into eq. 2: $2x - (5 - x) = 1 \rightarrow 3x = 6 \rightarrow x = 2$. Then $y = 3$. **Solution: (x, y) = (2, 3)**

Method 2: Elimination

- Multiply one or both equations so a variable has opposite coefficients.
- Add the equations to eliminate that variable; solve for the remaining variable.
- Substitute into either original equation to find the other variable.

Worked example (Medium):

Eq. 1: $3x + 2y = 12$

Eq. 2: $x - 2y = 4$

Add equations: $4x = 16 \rightarrow x = 4$. Substitute: $4 - 2y = 4 \rightarrow y = 0$. **Solution: (x, y) = (4, 0)**

Tips for Easy Sets

- Look for equations where one variable is already easy to isolate (coefficient 1 or -1).
- Always verify: plug **(x, y)** into **both** original equations.

SYSTEMS OF LINEAR EQUATIONS

Grade 8 Algebra · Easy Difficulty · Set 1

Name: _____

Date: _____

SCORE

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1 $\begin{cases} -2x - y = 14 \\ -x + y = -8 \end{cases}$

Solution: $(x, y) = (\quad , \quad)$

2 $\begin{cases} -2x - y = 2 \\ x - y = -13 \end{cases}$

Solution: $(x, y) = (\quad , \quad)$

3 $\begin{cases} y - x = -6 \\ 2x - y = 8 \end{cases}$

Solution: $(x, y) = (\quad , \quad)$

4 $\begin{cases} -2y + x = -25 \\ -y + x = -16 \end{cases}$

Solution: $(x, y) = (\quad , \quad)$

5 $\begin{cases} -x + y = 5 \\ x + y = 1 \end{cases}$

Solution: $(x, y) = (\quad , \quad)$

6 $\begin{cases} -x + y = 4 \\ -y - x = -4 \end{cases}$

Solution: $(x, y) = (\quad , \quad)$

7 $\begin{cases} -x - 2y = 1 \\ -x - y = 0 \end{cases}$

Solution: $(x, y) = (\quad , \quad)$

8 $\begin{cases} -x - y = 5 \\ -x + y = 15 \end{cases}$

Solution: $(x, y) = (\quad , \quad)$

9 $\begin{cases} x + 2y = -8 \\ x - y = 19 \end{cases}$

Solution: $(x, y) = (\quad , \quad)$

10 $\begin{cases} x - y = 1 \\ x + y = -3 \end{cases}$

Solution: $(x, y) = (\quad , \quad)$

SYSTEMS OF LINEAR EQUATIONS

Grade 8 Algebra · Easy Difficulty · Set 1

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11

$$\begin{cases} x + y = 1 \\ -x + 2y = 8 \end{cases}$$

Solution: $(x, y) = (\quad , \quad)$

12

$$\begin{cases} -x - 2y = 0 \\ x + y = 3 \end{cases}$$

Solution: $(x, y) = (\quad , \quad)$

13

$$\begin{cases} -x - y = 17 \\ -x - 2y = 27 \end{cases}$$

Solution: $(x, y) = (\quad , \quad)$

14

$$\begin{cases} x - y = -10 \\ -2x + y = 20 \end{cases}$$

Solution: $(x, y) = (\quad , \quad)$

15

$$\begin{cases} 2x + 2y = 2 \\ -x - 2y = 7 \end{cases}$$

Solution: $(x, y) = (\quad , \quad)$

16

$$\begin{cases} x - y = 12 \\ -x - y = 8 \end{cases}$$

Solution: $(x, y) = (\quad , \quad)$

17

$$\begin{cases} -y + x = -1 \\ x + y = -1 \end{cases}$$

Solution: $(x, y) = (\quad , \quad)$

18

$$\begin{cases} x - y = 13 \\ x + y = 1 \end{cases}$$

Solution: $(x, y) = (\quad , \quad)$

19

$$\begin{cases} -x - y = 1 \\ -y + x = 5 \end{cases}$$

Solution: $(x, y) = (\quad , \quad)$

20

$$\begin{cases} -x - y = -1 \\ x - y = -15 \end{cases}$$

Solution: $(x, y) = (\quad , \quad)$

ANSWER KEY

TEACHER REFERENCE

Grade 8 Algebra · Easy Difficulty · Set 1

#1

$$\begin{cases} -2x - y = 14 \\ -x + y = -8 \end{cases}$$

$$(x, y) = (-2, -10)$$

#2

$$\begin{cases} -2x - y = 2 \\ x - y = -13 \end{cases}$$

$$(x, y) = (-5, 8)$$

#3

$$\begin{cases} y - x = -6 \\ 2x - y = 8 \end{cases}$$

$$(x, y) = (2, -4)$$

#4

$$\begin{cases} -2y + x = -25 \\ -y + x = -16 \end{cases}$$

$$(x, y) = (-7, 9)$$

#5

$$\begin{cases} -x + y = 5 \\ x + y = 1 \end{cases}$$

$$(x, y) = (-2, 3)$$

#6

$$\begin{cases} -x + y = 4 \\ -y - x = -4 \end{cases}$$

$$(x, y) = (0, 4)$$

#7

$$\begin{cases} -x - 2y = 1 \\ -x - y = 0 \end{cases}$$

$$(x, y) = (1, -1)$$

#8

$$\begin{cases} -x - y = 5 \\ -x + y = 15 \end{cases}$$

$$(x, y) = (-10, 5)$$

#9

$$\begin{cases} x + 2y = -8 \\ x - y = 19 \end{cases}$$

$$(x, y) = (10, -9)$$

#10

$$\begin{cases} x - y = 1 \\ x + y = -3 \end{cases}$$

$$(x, y) = (-1, -2)$$

#11

$$\begin{cases} x + y = 1 \\ -x + 2y = 8 \end{cases}$$

$$(x, y) = (-2, 3)$$

#12

$$\begin{cases} -x - 2y = 0 \\ x + y = 3 \end{cases}$$

$$(x, y) = (6, -3)$$

#13

$$\begin{cases} -x - y = 17 \\ -x - 2y = 27 \end{cases}$$

$$(x, y) = (-7, -10)$$

#14

$$\begin{cases} x - y = -10 \\ -2x + y = 20 \end{cases}$$

$$(x, y) = (-10, 0)$$

#15

$$\begin{cases} 2x + 2y = 2 \\ -x - 2y = 7 \end{cases}$$

$$(x, y) = (9, -8)$$

#16

$$\begin{cases} x - y = 12 \\ -x - y = 8 \end{cases}$$

$$(x, y) = (2, -10)$$

#17

$$\begin{cases} -y + x = -1 \\ x + y = -1 \end{cases}$$

$$(x, y) = (-1, 0)$$

#18

$$\begin{cases} x - y = 13 \\ x + y = 1 \end{cases}$$

$$(x, y) = (7, -6)$$

#19

$$\begin{cases} -x - y = 1 \\ -y + x = 5 \end{cases}$$

$$(x, y) = (2, -3)$$

#20

$$\begin{cases} -x - y = -1 \\ x - y = -15 \end{cases}$$

$$(x, y) = (-7, 8)$$

SYSTEMS OF LINEAR EQUATIONS

Grade 8 Algebra · Medium Difficulty · Set 1

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1
$$\begin{cases} -12y - 8x = 80 \\ 3x + y = -23 \end{cases}$$

Solution: $(x, y) = (\quad , \quad)$

2
$$\begin{cases} x - y = 12 \\ -3y + 12x = 117 \end{cases}$$

Solution: $(x, y) = (\quad , \quad)$

3
$$\begin{cases} -x + 9y = -4 \\ -5x + y = -20 \end{cases}$$

Solution: $(x, y) = (\quad , \quad)$

4
$$\begin{cases} y + 11x = 1 \\ x - y = -1 \end{cases}$$

Solution: $(x, y) = (\quad , \quad)$

5
$$\begin{cases} x - 8y = -64 \\ 2x - y = -23 \end{cases}$$

Solution: $(x, y) = (\quad , \quad)$

6
$$\begin{cases} x + y = 7 \\ -7x - y = -25 \end{cases}$$

Solution: $(x, y) = (\quad , \quad)$

7
$$\begin{cases} -x + y = 0 \\ x + 7y = 72 \end{cases}$$

Solution: $(x, y) = (\quad , \quad)$

8
$$\begin{cases} -x - 11y = 45 \\ x + y = 5 \end{cases}$$

Solution: $(x, y) = (\quad , \quad)$

9
$$\begin{cases} -x - y = 5 \\ -x - 11y = -35 \end{cases}$$

Solution: $(x, y) = (\quad , \quad)$

10
$$\begin{cases} 11x + 4y = 78 \\ 8x - y = 45 \end{cases}$$

Solution: $(x, y) = (\quad , \quad)$

SYSTEMS OF LINEAR EQUATIONS

Grade 8 Algebra · Hard Difficulty · Set 1

Name: _____

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11

$$\begin{cases} -x - y = 3 \\ -x - 10y = -42 \end{cases}$$

Solution: $(x, y) = (\quad , \quad)$

12

$$\begin{cases} x + 2y = -16 \\ -10y - x = 56 \end{cases}$$

Solution: $(x, y) = (\quad , \quad)$

13

$$\begin{cases} -3x - y = -2 \\ x + 7y = -46 \end{cases}$$

Solution: $(x, y) = (\quad , \quad)$

14

$$\begin{cases} x - 10y = -29 \\ x - y = -11 \end{cases}$$

Solution: $(x, y) = (\quad , \quad)$

15

$$\begin{cases} -5x - y = -1 \\ -x + 6y = -25 \end{cases}$$

Solution: $(x, y) = (\quad , \quad)$

16

$$\begin{cases} x + 6y = 9 \\ 12x + y = -34 \end{cases}$$

Solution: $(x, y) = (\quad , \quad)$

17

$$\begin{cases} -x - 12y = 108 \\ 7x + 6y = -54 \end{cases}$$

Solution: $(x, y) = (\quad , \quad)$

18

$$\begin{cases} -10x + y = 60 \\ -y + x = -6 \end{cases}$$

Solution: $(x, y) = (\quad , \quad)$

19

$$\begin{cases} x + y = -4 \\ -y + 11x = 76 \end{cases}$$

Solution: $(x, y) = (\quad , \quad)$

20

$$\begin{cases} x + 11y = -89 \\ -x + 4y = -46 \end{cases}$$

Solution: $(x, y) = (\quad , \quad)$