

Grade 8 - Systems of Linear Equations - Answer Key

Common Core 8.EE.C.8a, 8.EE.C.8b, 8.EE.C.8c · maths-pdf.fr/en/

This answer key gives a full worked solution for each of the 21 problems on the systems of linear equations worksheet (Common Core 8.EE.C.8a, 8.EE.C.8b and 8.EE.C.8c). Compare each step with your own work, not only the final answer, and note any step where your method differed.

Grade 8 · Common Core State Standards: **8.EE.C.8a, 8.EE.C.8b, 8.EE.C.8c**

Exercise 1 - Check a solution

$2+3=5$ is true. $2\cdot 2-3=1$ is true.

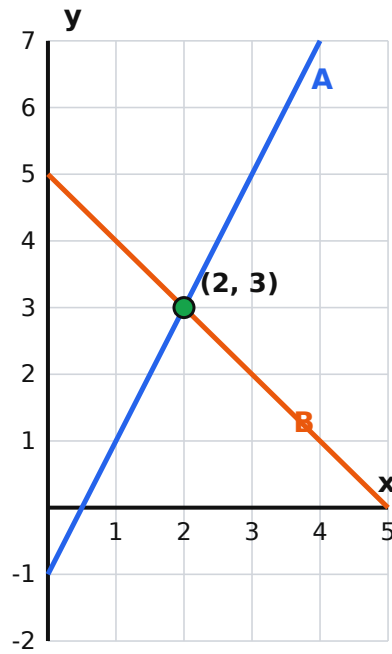
Yes

Exercise 2 - Not a solution

$1+2=3$ is true, but $1-2=-1$, not 2.

No

Exercise 3 - Solve by graphing

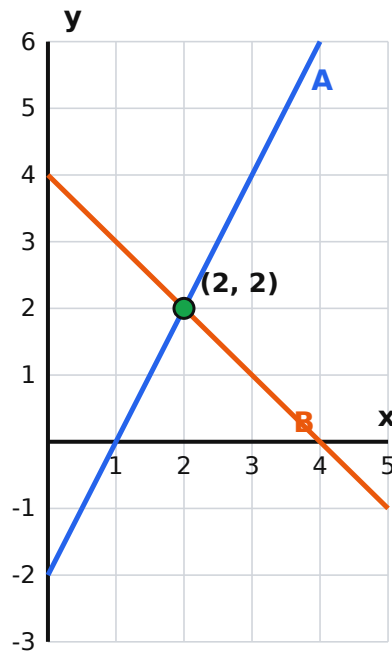


The lines cross at (2, 3).

Check: $2 \cdot 2 - 1 = 3$ and $-2 + 5 = 3$.

(2,3)

Exercise 4 - Graph two lines



A: $y = 2x - 2$ and B: $y = -x + 4$.

Check: $2 \cdot 2 - 2 = 2$ and $-2 + 4 = 2$.

(2,2)

Exercise 5 - Substitution 1

$x + 2x = 15$, so $x = 5$.

$y = 2 \cdot 5 = 10$.

(5,10)

Exercise 6 - Substitution 2

$3x + (x + 3) = 19$, so $4x = 16$ and $x = 4$.

$y = 4 + 3 = 7$.

(4,7)

Exercise 7 - Substitution 3

$2(y - 2) + 3y = 21$, so $5y - 4 = 21$ and $y = 5$.

$x = 5 - 2 = 3$.

(3,5)

Exercise 8 - Elimination 1

Add: $2x = 22$, so $x = 11$.

$11 + y = 16$, so $y = 5$.

(11,5)

Exercise 9 - Elimination 2

Add: $5x = 20$, so $x = 4$.

$12 + y = 17$, so $y = 5$.

(4,5)

Exercise 10 - Elimination with a multiplier

Multiply the second equation by 2: $2x+2y=10$.

Subtract from the first: $y=2$. Then $x=3$.

(3,2)

Exercise 11 - Elimination, opposite terms

Add: $8x=24$, so $x=3$.

$9+2y=19$, so $y=5$.

(3,5)

Exercise 12 - Multiply both equations

Multiply the first by 3 and the second by 2: $6x+9y=21$ and $6x+4y=16$.

Subtract: $5y=5$, so $y=1$ and $x=2$.

(2,1)

Exercise 13 - Parallel lines

Both lines have slope -3 but different intercepts, so they are parallel. Setting them equal gives $2=7$, which is false.

No solution

Exercise 14 - Same line

The first equation is the second multiplied by 2, so they describe the same line.

Infinitely many solutions

Exercise 15 - Classify

Multiplying the first equation by 2 gives $6x - 2y = 8$. The equations are equivalent.

Infinitely many solutions

Exercise 16 - School play tickets

Let a be adult tickets and s be student tickets: $a + s = 50$ and $12a + 8s = 480$.

Substitute $s = 50 - a$: $12a + 400 - 8a = 480$, so $4a = 80$ and $a = 20$.

20 adult tickets and 30 student tickets

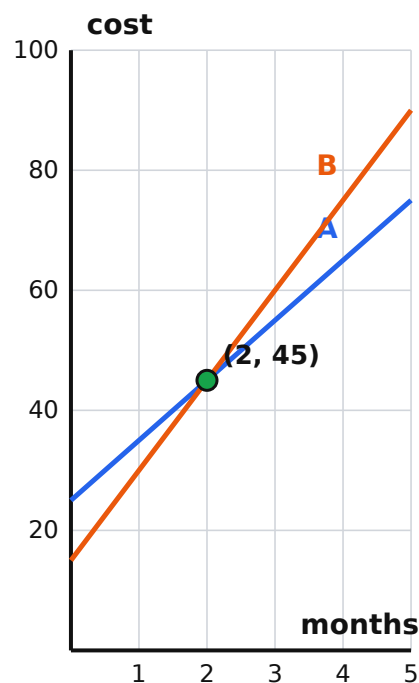
Exercise 17 - Bake sale

$m + c = 40$ and $2m + 1.5c = 65$. Then $c = 40 - m$.

$2m + 60 - 1.5m = 65$, so $0.5m = 5$ and $m = 10$.

10 muffins and 30 cookies

Exercise 18 - Gym plans



The plans cost the same at 2 months.

$$10x + 25 = 15x + 15, \text{ so } 10 = 5x \text{ and } x = 2.$$

$$\text{Cost: } 10 \cdot 2 + 25 = 45.$$

2 months, \\$45

Exercise 19 - Boat and current

$$b + c = 18 \text{ and } b - c = 12. \text{ Add: } 2b = 30, \text{ so } b = 15.$$

$$c = 18 - 15 = 3.$$

Boat 15 mph, current 3 mph

Exercise 20 - Coins

$$d + q = 30 \text{ and } 10d + 25q = 450 \text{ (in cents). Substitute } d = 30 - q: 300 - 10q + 25q = 450.$$

$$15q = 150, \text{ so } q = 10 \text{ and } d = 20.$$

20 dimes and 10 quarters

Exercise 21 - Interpret the point

It is the only ordered pair that lies on both lines, so $x = 4$ and $y = 7$ make both equations true.

(4, 7) is the solution of the system