

Algebra 1 - Solving Linear Equations in One Variable - Answer Key

Common Core A-REI.A.1, A-REI.B.3, A-CED.A.1 · maths-pdf.fr/en/

Here are full solutions for the linear equations worksheet. Read each step, not just the bold answer, and compare it with your own method. Redo any problem you missed, and note which kind of mistake you made so you can avoid it on the test.

Algebra 1 · Common Core State Standards: **A-REI.A.1, A-REI.B.3, A-CED.A.1**

Exercise 1 - Undo addition

Subtract 7 from both sides: $x = 15 - 7$.

$$x = 8$$

Exercise 2 - Undo multiplication

Divide both sides by -4 : $x = \frac{28}{-4}$.

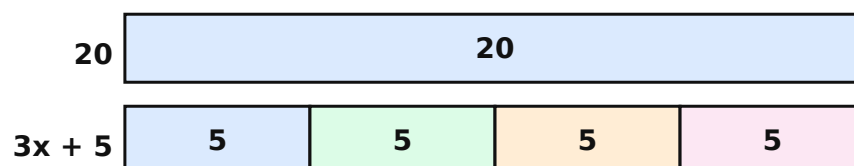
$$x = -7$$

Exercise 3 - Undo division

Multiply both sides by 5: $x = -3 \cdot 5$.

$$x = -15$$

Exercise 4 - Two steps with a tape diagram



Each x equals 5.

Subtract 5 from both sides: $3x = 15$.

Divide by 3: $x = 5$.

Check: $3(5) + 5 = 20$.

$$x = 5$$

Exercise 5 - Two-step with negatives

Add 9 to both sides: $2x = 8$.

Divide by 2: $x = 4$.

$$x = 4$$

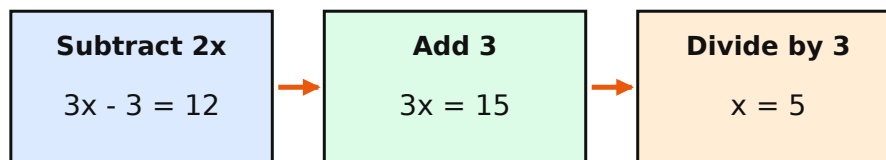
Exercise 6 - Fraction two-step

Subtract 3: $\frac{x}{4} = 4$.

Multiply by 4: $x = 16$.

$$x = 16$$

Exercise 7 - Variables on both sides



Steps for the equation.

Subtract $2x$ from both sides: $3x - 3 = 12$.

Add 3: $3x = 15$. Divide by 3: $x = 5$.

$$x = 5$$

Exercise 8 - Larger coefficient on the right

Subtract $4x$: $7 = 5x - 13$.

Add 13: $20 = 5x$. Divide by 5: $4 = x$.

$$x = 4$$

Exercise 9 - Distribute once

Distribute: $3x - 6 = 2x + 5$.

Subtract $2x$: $x - 6 = 5$. Add 6: $x = 11$.

$$x = 11$$

Exercise 10 - Distribute on both sides

Distribute: $6x + 2 = 4x + 20$.

Subtract $4x$: $2x + 2 = 20$. Subtract 2: $2x = 18$.

Divide by 2: $x = 9$.

$$x = 9$$

Exercise 11 - Fraction coefficient

Add 4: $\frac{2}{3}x = 12$.

Multiply both sides by the reciprocal $\frac{3}{2}$: $x = 12 \cdot \frac{3}{2} = 18$.

$$x = 18$$

Exercise 12 - Combine like terms first

Combine $4x - x = 3x$: $3x + 2 = 17$.

Subtract 2: $3x = 15$. Divide by 3: $x = 5$.

$$x = 5$$

Exercise 13 - No solution

Distribute: $3x + 6 = 3x + 5$.

Subtract $3x$ from both sides: $6 = 5$, which is false for every value of x .

No solution

Exercise 14 - Infinitely many solutions

Distribute: $2x+8=2x+8$.

Subtract $2x$: $8=8$, which is always true.

Infinitely many solutions (all real numbers)

Exercise 15 - Check a solution

Substitute: $5(-2)+4=-10+4=-6$.

The left side equals the right side.

Yes, $x = -2$ is a solution

Exercise 16 - Concert tickets

Equation: $4t+6=38$.

Subtract 6: $4t=32$. Divide by 4: $t=8$.

\$8 per ticket

Exercise 17 - Saving for a bike

Equation: $40+15w=190$.

Subtract 40: $15w=150$. Divide by 15: $w=10$.

Check: $40+15(10)=190$.

10 weeks

Exercise 18 - Rides on two passes

Costs are equal when $20+3r=5+4r$.

Subtract $3r$: $20=5+r$. Subtract 5: $15=r$.

Cost: $20+3(15)=65$ and $5+4(15)=65$. The table shows the passes switching order between 10 and 20 rides.

15 rides; \$65

Exercise 19 - Jacket money

Three-fifths of her money is \$27: $\frac{3}{5}m = 27$.

Multiply by $\frac{5}{3}$: $m = 27 \cdot \frac{5}{3} = 45$.

\$45

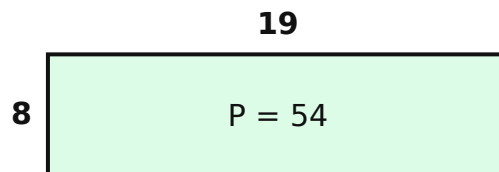
Exercise 20 - Consecutive integers

Let the integers be n , $n+1$, and $n+2$. Then $n+(n+1)+(n+2)=87$.

Combine: $3n+3=87$. Subtract 3: $3n=84$. Divide: $n=28$.

28, 29, 30

Exercise 21 - Garden fence



Width 8 feet, length 19 feet.

Perimeter: $2w+2(2w+3)=54$.

Distribute and combine: $6w+6=54$. Subtract 6: $6w=48$. Divide: $w=8$.

Length: $2(8)+3=19$.

Check: $2(8)+2(19)=54$.

Width 8 feet, length 19 feet