

# Solving One-Step Equations

Name: \_\_\_\_\_ Date: \_\_\_\_\_ Score: \_\_\_\_\_ / 24

## Quick Review

An **equation** says two expressions are equal, and **solving** it means finding the value of the variable that makes it true. The big idea is to use **inverse operations** to get the variable alone: addition is undone by subtraction, and multiplication is undone by division. Whatever you do to one side, you must do to the **other side** too, so the equation stays balanced. After solving, **check** your answer by substituting it back into the original equation.

◇ **Example:** Solve  $x + 7 = 19$ .

⇒ We want  $x$  all by itself. Right now 7 is being added to it, so we undo that by subtracting 7 — and to keep the equation balanced, we subtract 7 from *both* sides. On the left,  $x + 7 - 7$  leaves just  $x$ . On the right,  $19 - 7 = 12$ . So  $x = 12$ . Let's check:  $12 + 7 = 19$ , which matches the original equation perfectly.

**Answer:**  $x = 12$

## PRACTICE

Solve each equation for the variable. Check your answer.

- |                      |       |                       |       |
|----------------------|-------|-----------------------|-------|
| 1. $x + 5 = 12$      | _____ | 11. $9y = 81$         | _____ |
| 2. $y - 3 = 10$      | _____ | 12. $t + 6 = 6$       | _____ |
| 3. $n + 8 = 20$      | _____ | 13. $\frac{n}{7} = 4$ | _____ |
| 4. $4x = 28$         | _____ | 14. $b - 14 = 6$      | _____ |
| 5. $\frac{m}{3} = 6$ | _____ | 15. $12x = 60$        | _____ |
| 6. $a - 9 = 4$       | _____ | 16. $r + 23 = 40$     | _____ |
| 7. $k + 15 = 25$     | _____ | 17. $\frac{c}{4} = 9$ | _____ |
| 8. $6p = 42$         | _____ | 18. $8m = 0$          | _____ |
| 9. $\frac{w}{5} = 8$ | _____ | 19. $x - 7 = 35$      | _____ |
| 10. $x - 11 = 11$    | _____ | 20. $15p = 45$        | _____ |

## Word Problems

21. After spending \$8, Leo has \$15 left. Write and solve the equation  $x - 8 = 15$  to find how much money he started with.  
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22. A box of crayons is shared equally among 6 students, and each gets 4 crayons. Solve  $\frac{c}{6} = 4$  to find how many crayons were in the box.  
\_\_\_\_\_
23. Tickets cost \$7 each, and a group spent \$56. Solve  $7t = 56$  to find how many tickets the group bought.  
\_\_\_\_\_
24. Maya read 9 more pages today than yesterday, for a total of 24 pages today. Solve  $p + 9 = 24$  to find how many pages she read yesterday.  
\_\_\_\_\_



## Answer Keys

- |              |                      |
|--------------|----------------------|
| 1. $x = 7$   | 13. $n = 28$         |
| 2. $y = 13$  | 14. $b = 20$         |
| 3. $n = 12$  | 15. $x = 5$          |
| 4. $x = 7$   | 16. $r = 17$         |
| 5. $m = 18$  | 17. $c = 36$         |
| 6. $a = 13$  | 18. $m = 0$          |
| 7. $k = 10$  | 19. $x = 42$         |
| 8. $p = 7$   | 20. $p = 3$          |
| 9. $w = 40$  | 21. $x = 23$ dollars |
| 10. $x = 22$ | 22. $c = 24$ crayons |
| 11. $y = 9$  | 23. $t = 8$ tickets  |
| 12. $t = 0$  | 24. $p = 15$ pages   |

### Step-by-Step Explanations

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|--|---|
| <p>1. Subtract 5 from both sides: <math>12 - 5 = 7</math>, so <math>x = 7</math>.</p> <p>2. Add 3 to both sides: <math>10 + 3 = 13</math>, so <math>y = 13</math>.</p> <p>3. Subtract 8 from both sides: <math>20 - 8 = 12</math>, so <math>n = 12</math>.</p> <p>4. Divide both sides by 4: <math>28 \div 4 = 7</math>, so <math>x = 7</math>.</p> <p>5. Multiply both sides by 3: <math>6 \times 3 = 18</math>, so <math>m = 18</math>.</p> <p>6. Add 9 to both sides: <math>4 + 9 = 13</math>, so <math>a = 13</math>.</p> <p>7. Subtract 15 from both sides: <math>25 - 15 = 10</math>, so <math>k = 10</math>.</p> <p>8. Divide both sides by 6: <math>42 \div 6 = 7</math>, so <math>p = 7</math>.</p> <p>9. Multiply both sides by 5: <math>8 \times 5 = 40</math>, so <math>w = 40</math>.</p> <p>10. Add 11 to both sides: <math>11 + 11 = 22</math>, so <math>x = 22</math>.</p> <p>11. Divide both sides by 9: <math>81 \div 9 = 9</math>, so <math>y = 9</math>.</p> <p>12. Subtract 6 from both sides: <math>6 - 6 = 0</math>, so <math>t = 0</math>.</p> | <p>13. Multiply both sides by 7: <math>4 \times 7 = 28</math>, so <math>n = 28</math>.</p> <p>14. Add 14 to both sides: <math>6 + 14 = 20</math>, so <math>b = 20</math>.</p> <p>15. Divide both sides by 12: <math>60 \div 12 = 5</math>, so <math>x = 5</math>.</p> <p>16. Subtract 23 from both sides: <math>40 - 23 = 17</math>, so <math>r = 17</math>.</p> <p>17. Multiply both sides by 4: <math>9 \times 4 = 36</math>, so <math>c = 36</math>.</p> <p>18. Divide both sides by 8: <math>0 \div 8 = 0</math>, so <math>m = 0</math>.</p> <p>19. Add 7 to both sides: <math>35 + 7 = 42</math>, so <math>x = 42</math>.</p> <p>20. Divide both sides by 15: <math>45 \div 15 = 3</math>, so <math>p = 3</math>.</p> <p>21. Add 8 to both sides: <math>15 + 8 = 23</math>. Leo started with 23 dollars.</p> <p>22. Multiply both sides by 6: <math>4 \times 6 = 24</math>. The box held 24 crayons.</p> <p>23. Divide both sides by 7: <math>56 \div 7 = 8</math>. The group bought 8 tickets.</p> <p>24. Subtract 9 from both sides: <math>24 - 9 = 15</math>. Maya read 15 pages yesterday.</p> |
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