

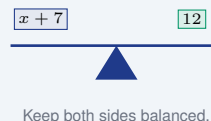
# One-Step Equations

Name: \_\_\_\_\_ Date: \_\_\_\_\_ Score: \_\_\_\_\_ / 18

## Quick Review and Helpful Hints

To solve a one-step equation, undo the operation attached to the variable using its *inverse*: add to undo subtraction, subtract to undo addition, multiply to undo division, divide to undo multiplication. Whatever you do to one side, do to the *other* side to keep the equation balanced.

▶ **Example:** Solve  $x + 7 = 12$ . **Work:** The 7 is added to  $x$ , so undo it by subtracting 7 from both sides:  $x + 7 - 7 = 12 - 7$ . ★ **Answer:**  $x = 5$



### Practice Problems

Solve each equation for the variable.

- |                      |       |                        |       |
|----------------------|-------|------------------------|-------|
| 1. $x + 5 = 9$       | _____ | 8. $\frac{x}{5} = 3$   | _____ |
| 2. $x - 3 = 8$       | _____ | 9. $6x = -24$          | _____ |
| 3. $4x = 20$         | _____ | 10. $x + 2 = 2$        | _____ |
| 4. $\frac{x}{2} = 6$ | _____ | 11. $x - 9 = 0$        | _____ |
| 5. $x + 10 = 4$      | _____ | 12. $7x = 49$          | _____ |
| 6. $3x = 18$         | _____ | 13. $\frac{x}{3} = -4$ | _____ |
| 7. $x - 7 = -2$      | _____ | 14. $2x = -10$         | _____ |

### Word Problems

15. After spending \$8, you have \$15 left. How much did you start with? \_\_\_\_\_
16. Five equal boxes weigh 35 pounds in all. How much does each box weigh? \_\_\_\_\_
17. A number tripled equals 21. What is the number? \_\_\_\_\_
18. After adding 6 to a number, the result is 2. What is the number? \_\_\_\_\_



## Answer Keys

1.  $x = 4$

2.  $x = 11$

3.  $x = 5$

4.  $x = 12$

5.  $x = -6$

6.  $x = 6$

7.  $x = 5$

8.  $x = 15$

9.  $x = -4$

10.  $x = 0$

11.  $x = 9$

12.  $x = 7$

13.  $x = -12$

14.  $x = -5$

15. \$23

16. 7 lb

17. 7

18. -4

### Step-by-Step Explanations

1. Start by naming the process: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is The 5 is added to  $x$ , so undo it by subtracting 5 from both sides:  $x + 5 = 9$ .  $x + 5 - 5 = 9 - 5$ . So the final answer is  $x = 4$ .

2. A good way to think about this is: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is The 3 is subtracted, so undo it by adding 3 to both sides:  $x - 3 = 8$ .  $x - 3 + 3 = 8 + 3$ . So the final answer is  $x = 11$ .

3. Step by step: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is  $x$  is multiplied by 4, so divide both sides by 4:  $4x = 20$ .  $4x \div 4 = 20 \div 4$ . So the final answer is  $x = 5$ .

4. Take it one move at a time: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is  $x$  is divided by 2, so multiply both sides by 2:  $x \div 2 = 6$ .  $x \div 2 \times 2 = 6 \times 2$ . So the final answer is  $x = 12$ .

5. Start by naming the process: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is Subtract 10 from both sides:  $x - 10 = 4$ .  $x - 10 + 10 = 4 + 10$ . So the final answer is  $x = 14$ .

6. A good way to think about this is: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is Divide both sides by 3:  $3x = 18$ .  $3x \div 3 = 18 \div 3$ . So the final answer is  $x = 6$ .

7. Step by step: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is Add 7 to both sides:  $x - 7 = -2$ .  $x - 7 + 7 = -2 + 7$ . So the final answer is  $x = 5$ .

8. Take it one move at a time: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is Multiply both sides by 5:  $x \div 5 = 3$ .  $x \div 5 \times 5 = 3 \times 5$ . So the final answer is  $x = 15$ .

9. Start by naming the process: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is Divide both sides by 6:  $6x = -24$ .  $6x \div 6 = -24 \div 6$ . So the final answer is  $x = -4$ .

10. A good way to think about this is: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is Subtract 2 from both sides:  $x + 2 = 2$ .  $x + 2 - 2 = 2 - 2$ . So the final answer is  $x = 0$ .

11. Step by step: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is Add 9 to both sides:  $x - 9 = 0$ .  $x - 9 + 9 = 0 + 9$ . So the final answer is  $x = 9$ .

12. Take it one move at a time: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is Divide both sides by 7:  $7x = 49$ .  $7x \div 7 = 49 \div 7$ . So the final answer is  $x = 7$ .

13. Start by naming the process: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is Multiply both sides by 3:  $x \div 3 = -4$ .  $x \div 3 \times 3 = -4 \times 3$ . So the final answer is  $x = -12$ .

14. A good way to think about this is: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is Divide both sides by 2:  $2x = -10$ .  $2x \div 2 = -10 \div 2$ . So the final answer is  $x = -5$ .

15. Step by step: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is Let  $x$  be the starting amount. Spending \$8 leaves \$15:  $x - 8 = 15$ . Add 8:  $x - 8 + 8 = 15 + 8$ . So the final answer is \$23.

16. Take it one move at a time: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is Five equal boxes weigh 35:  $5x = 35$ . Divide by 5:  $5x \div 5 = 35 \div 5$ . So the final answer is 7 lb.

17. Start by naming the process: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is Tripled means  $3x = 21$ . Divide by 3:  $3x \div 3 = 21 \div 3$ . So the final answer is 7.

18. A good way to think about this is: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is Adding 6 gives 2:  $x + 6 = 2$ . Subtract 6:  $x + 6 - 6 = 2 - 6$ . So the final answer is -4.



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