

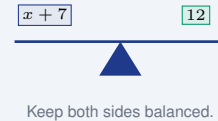
One-Step Equations

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. $x = 4$ | 7. $x = 5$ | 13. $x = -12$ |
| 2. $x = 11$ | 8. $x = 15$ | 14. $x = -5$ |
| 3. $x = 5$ | 9. $x = -4$ | 15. \$23 |
| 4. $x = 12$ | 10. $x = 0$ | 16. 7 lb |
| 5. $x = -6$ | 11. $x = 9$ | 17. 7 |
| 6. $x = 6$ | 12. $x = 7$ | 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: $x + 5 - 5 = 4 - 5$. So the final answer is $x = -1$.
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: $x - 3 + 3 = 11 - 3$. So the final answer is $x = 8$.
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: $4x = 20 \div 4 = 5$. 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: $x \div 2 \times 2 = 12 \times 2$. So the final answer is $x = 24$.
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: $x + 10 - 10 = 4 - 10$. So the final answer is $x = -6$.
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: $3x = 18 \div 3 = 6$. 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: $x - 7 + 7 = 5 - 7$. So the final answer is $x = -2$.
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: $x \div 5 \times 5 = 3 \times 5 = 15$. 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: $6x = -24 \div 6 = -4$. 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: $x + 2 - 2 = 2 - 2 = 0$. 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: $x - 9 + 9 = 0 + 9 = 9$. 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 Multiply both sides by 7: $x \div 7 \times 7 = 49 \div 7 = 7$. 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: $x \div 3 \times 3 = -4 \times 3 = -12$. 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: $x \div 2 \times 2 = -10 \div 2 = -5$. 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: $x = 23$. 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: $x = 7$ lb each. 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: $x = 7$. 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: $x = -4$. So the final answer is -4 .



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