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:** $x = 5$

Keep both sides balanced.

Practice Problems

Solve each equation for the variable.

1. $x + 5 = 9$ _____

2. $x - 3 = 8$ _____

3. $4x = 20$ _____

4. $\frac{x}{2} = 6$ _____

5. $x + 10 = 4$ _____

6. $3x = 18$ _____

7. $x - 7 = -2$ _____

8. $\frac{x}{5} = 3$ _____

9. $6x = -24$ _____

10. $x + 2 = 2$ _____

11. $x - 9 = 0$ _____

12. $7x = 49$ _____

13. $\frac{x}{3} = -4$ _____

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?

_____

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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: $x = 9 - 5 = 4$. 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: $x = 8 + 3 = 11$. 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: $x = 20 \div 4 = 5$. 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: $x = 6 \times 2 = 12$. 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: $x = 4 - 10 = -6$. 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: $x = 18 \div 3 = 6$. 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: $x = -2 + 7 = 5$. 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: $x = 3 \times 5 = 15$. 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: $x = -24 \div 6 = -4$. 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: $x = 2 - 2 = 0$. 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: $x = 0 + 9 = 9$. 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 Divide both sides by 7: $x = 49 \div 7 = 7$. 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: $x = -4 \times 3 = -12$. 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: $x = -10 \div 2 = -5$. 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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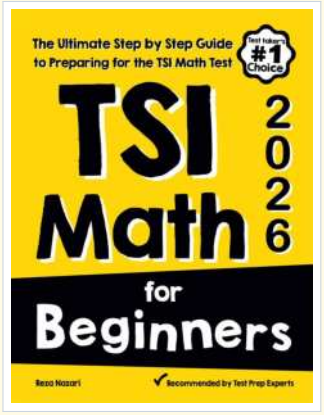

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