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. $x + 5 = 12$ _____

2. $y - 3 = 10$ _____

3. $n + 8 = 20$ _____

4. $4x = 28$ _____

5. $\frac{m}{3} = 6$ _____

6. $a - 9 = 4$ _____

7. $k + 15 = 25$ _____

8. $6p = 42$ _____

9. $\frac{w}{5} = 8$ _____

10. $x - 11 = 11$ _____

11. $9y = 81$ _____

12. $t + 6 = 6$ _____

13. $\frac{n}{7} = 4$ _____

14. $b - 14 = 6$ _____

15. $12x = 60$ _____

16. $r + 23 = 40$ _____

17. $\frac{c}{4} = 9$ _____

18. $8m = 0$ _____

19. $x - 7 = 35$ _____

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. _____

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

Step-by-Step Explanations

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

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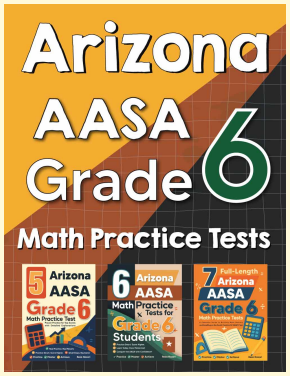

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