

Solving One-Step Equations

Name: _____ Date: _____ Score: _____ / 24

Q 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.

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|----------------------|-------|-----------------------|-------|
| 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.

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

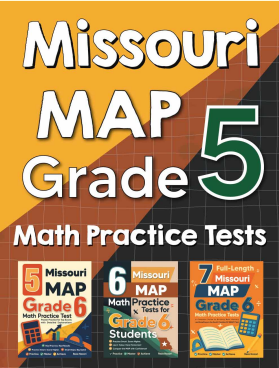
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|--------------|----------------------|
| 1. $x = 7$ | 13. $n = 28$ |
| 2. $y = 13$ | 14. $b = 20$ |
| 3. $n = 12$ | 15. $x = 5$ |
| 4. $x = 7$ | 16. $r = 17$ |
| 5. $m = 18$ | 17. $c = 36$ |
| 6. $a = 13$ | 18. $m = 0$ |
| 7. $k = 10$ | 19. $x = 42$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