Solving One-Step Equations

Name: _____	Date: _____	Score: _____ / 24

Quick Review

To solve a one-step equation, do the **opposite** of whatever's happening to the variable, and do it to *both sides*. If something's being added, subtract it. If it's being subtracted, add. If it's being multiplied, divide. If it's being divided, multiply. That's the whole game. The technical name is the **Properties of Equality** — as long as you do the same thing to both sides of the equals sign, the equation stays balanced. After you find your answer, **check it**: substitute the value back into the original equation. If both sides come out the same, you nailed it.

PRACTICE

Solve each equation.

1. $x + 5 = 12$ _____
2. $n - 3 = 10$ _____
3. $y + 9 = -2$ _____
4. $a - 7 = -1$ _____
5. $3x = 21$ _____
6. $-5m = 35$ _____
7. $\frac{x}{4} = 6$ _____
8. $\frac{n}{-3} = 9$ _____
9. $8p = -56$ _____
10. $x + 2.5 = 7$ _____
11. $\frac{y}{5} = -4$ _____
12. $w - 1.8 = 3.2$ _____
13. $-12 + x = 4$ _____
14. $-y = 15$ _____
15. $\frac{3}{4}x = 12$ _____
16. $x - \frac{1}{2} = \frac{3}{4}$ _____
17. $-7 = k + 3$ _____
18. $\frac{n}{2} = -9$ _____
19. $6 = \frac{x}{-4}$ _____
20. $0.2x = 3$ _____

Word Problems

21. Liam had some money in his wallet. After spending $\$12$ on lunch, he has $\$23$ left. Write and solve an equation to find how much he started with.

_____

22. A recipe needs 5 equal cups of flour, totaling 20 ounces. How many ounces are in each cup?

_____

23. A pizza costs the same as 4 ice cream cones. If a pizza costs $\$18$, how much does each ice cream cone cost?

_____

24. Sara's age plus 14 equals her uncle's age. If her uncle is 43, how old is Sara?

_____

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Answer Keys

1. $x = 7$
2. $n = 13$
3. $y = -11$
4. $a = 6$
5. $x = 7$
6. $m = -7$
7. $x = 24$
8. $n = -27$
9. $p = -7$
10. $x = 4.5$
11. $y = -20$
12. $w = 5$
13. $x = 16$
14. $y = -15$
15. $x = 16$
16. $x = \frac{5}{4}$
17. $k = -10$
18. $n = -18$
19. $x = -24$
20. $x = 15$
21. $x = \$35$
22. $c = 4$ oz
23. $c = \$4.50$
24. $s = 29$

Step-by-Step Tutor Notes

1. Move carefully through the arithmetic; one clean operation usually unlocks the next one. 5 is added to x. Subtract 5 from both sides: $x = 12 - 5 = 7$. After simplifying, the answer is $x = 7$.
2. Keep the order of operations in view, then simplify without skipping the sign check. 3 is subtracted, so add 3 to both sides: $n = 10 + 3 = 13$. After simplifying, the answer is $n = 13$.
3. Subtract 9 from both sides: $y = -2 - 9 = -11$. (Subtracting a positive from a negative pushes you further negative.).
4. Keep the order of operations in view, then simplify without skipping the sign check. Add 7 to both sides: $a = -1 + 7 = 6$. After simplifying, the answer is $a = 6$.
5. Keep the order of operations in view, then simplify without skipping the sign check. x is being multiplied by 3. Divide both sides by 3: $x = 21 \div 3 = 7$. After simplifying, the answer is $x = 7$.
6. Divide both sides by -5: $m = 35 \div (-5) = -7$. Dividing a positive by a negative gives a negative.
7. x is being divided by 4. Do the opposite — multiply both sides by 4: $x = 6 \cdot 4 = 24$.
8. Move carefully through the arithmetic; one clean operation usually unlocks the next one. Multiply both sides by -3: $n = 9 \cdot (-3) = -27$. After simplifying, the answer is $n = -27$.
9. Work one inverse operation at a time and keep both sides balanced. Divide both sides by 8: $p = -56 \div 8 = -7$. After simplifying, the answer is $p = -7$.
10. Subtract 2.5 from both sides: $x = 7 - 2.5 = 4.5$. Decimals follow the same rules as whole numbers.
11. Keep the order of operations in view, then simplify without skipping the sign check. Multiply both sides by 5: $y = -4 \cdot 5 = -20$. After simplifying, the answer is $y = -20$.
12. Add 1.8 to both sides: $w = 3.2 + 1.8 = 5$. Notice the decimal answer came out clean — that's a good sanity-check signal.
13. -12 is added (or 12 subtracted, same thing). Add 12 to both sides: $x = 4 + 12 = 16$.
14. Move carefully through the arithmetic; one clean operation usually unlocks the next one. $-y$ means $-1 \cdot y$. Divide both sides by -1 (or just flip signs): $y = -15$. After simplifying, the answer is $y = -15$.
15. Multiply both sides by the reciprocal $\frac{4}{3}$: $x = 12 \cdot \frac{4}{3} = 16$. (Multiplying by a reciprocal is the slick way to undo a fractional coefficient.).
16. Add $\frac{1}{2}$ to both sides. Find a common denominator: $x = \frac{3}{4} + \frac{2}{4} = \frac{5}{4}$.
17. Variable's on the right — doesn't matter, same rule. Subtract 3 from both sides: $-7 - 3 = k$, so $k = -10$.
18. Keep the order of operations in view, then simplify without skipping the sign check. Multiply both sides by 2: $n = -9 \cdot 2 = -18$. After simplifying, the answer is $n = -18$.
19. Keep the order of operations in view, then simplify without skipping the sign check. Multiply both sides by -4: $x = 6 \cdot (-4) = -24$. After simplifying, the answer is $x = -24$.
20. Divide both sides by 0.2: $x = 3 \div 0.2 = 15$. (Dividing by 0.2 is the same as multiplying by 5, which is sometimes easier mental math.).
21. Let x be what he started with. "After spending $\$12$" means we subtract: $x - 12 = 23$. Add 12 to both sides: $x = 23 + 12 = 35$. Liam started with $\$35$.
22. Let c be ounces per cup. Five cups times c ounces each gives the total: $5c = 20$. Divide both sides by 5: $c = 4$ ounces per cup.
23. Let c be the cost of one cone. Four cones equal one pizza: $4c = 18$. Divide both sides by 4: $c = 4.50$ dollars.
24. Let s be Sara's age. The equation is $s + 14 = 43$. Subtract 14 from both sides: $s = 43 - 14 = 29$. Sara is 29 years old.

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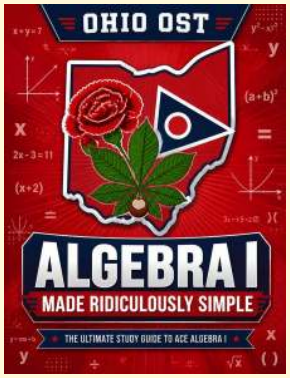

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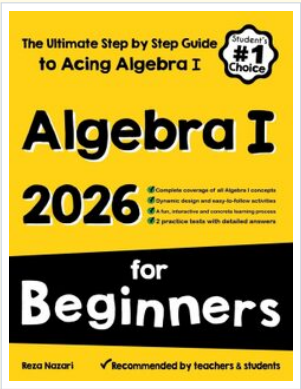

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