Solving Multi-Step Equations

Classwork-Activity

Name: KEY

Date:_____ Per____

To solve equations with more than on operation, undo operations by working backward which is called the algebraic method. Reverse the usual order of operations as you work.

Example Solve $5x + 3 = 23$.

$5x + 3 = 23$	Original equation.
$5x + 3 - 3 = 23 - 3$	Subtract 3 from each side.
$5x = 20$	Simplify.
$\frac{5x}{5} = \frac{20}{5}$	Divide each side by 5.
$x = 4$	Simplify.

Example: Solve $\frac{n}{4} - 2 = 8$ original equation

+2 +2 Add 2 to both sides

$\frac{n}{4} = 10$ Simplify

•4 •4 Multiply each side by 4

n = 40

Solve each equation using the Algebraic Method.

1. $5x + 2 = 27$
   $-2 \quad -2$
   $\frac{5x}{5} = \frac{25}{5}$
   $x = 5$

2. $6x + 9 = 27$
   $-9 \quad -9$
   $\frac{6x}{6} = \frac{18}{6}$
   $x = 3$

3. $5x + 16 = 51$
   $-16 \quad -16$
   $\frac{5x}{5} = \frac{35}{5}$
   $x = 7$

4. $14n - 8 = 34$
   $+8 \quad +8$
   $\frac{14n}{14} = \frac{42}{14}$
   $n = 3$

5. $0.6x - 1.5 = 1.8$
   $+1.5 \quad +1.5$
   $\frac{0.6x}{0.6} = \frac{3.3}{0.6}$
   $x = 5.5$

6. $\frac{7}{8}p - 4 = 10$
   $+4 \quad +4$
   $\frac{7}{8}p = 14$
   $\div\frac{7}{8} \quad \div\frac{7}{8}$
   $p = 16$

7. $16 = \frac{(d - 12)}{14}$
   $\cdot 14 \quad \cdot 14$
   $224 = d - 12$
   $+12 \quad +12$
   $236 = d$

8. $8 + \frac{3n}{12} = 13$
   $-8 \quad -8$
   $12 \cdot \frac{3n}{12} = 5 \cdot 12$
   $\frac{3n}{3} = \frac{60}{3}$
   $n = 20$

9. $\frac{g}{-5} + 3 = -13$
   $-3 \quad -3$
   $\frac{g}{-5} = -16$
   $\cdot -5 \quad \cdot -5$
   $g = 80$

10. $\frac{(4b + 8)}{-2} = 10$
    $\cdot -2 \quad \cdot -2$
    $4b + 8 = -20$
    $-8 \quad -8$
    $\frac{4b}{4} = \frac{-28}{4}$
    $b = -7$

11. $0.2x - 8 = -2$
    $+8 \quad +8$
    $\frac{0.2x}{0.2} = \frac{6}{0.2}$
    $x = 30$

12. $3.2y - 1.8 = 3$
    $+1.8 \quad +1.8$
    $\frac{3.2y}{3.2} = \frac{4.8}{3.2}$
    $y = 1.5$

Write an equation and solve each problem using the Algebraic Method.

13. A number is divided by 2, and then the quotient is added to 8. The result is 33. Find the number.

$\frac{n}{2} + 8 = 33$

$-8 \quad -8$

$\frac{n}{2} = 25$

$\cdot 2 \quad \cdot 2$

$n = 50$

14. Two is subtracted from a number, and then the difference is divided by 3. The result is 30. Find the number.

$\frac{n-2}{3} = 30$

$\cdot 3 \quad \cdot 3$

$n - 2 = 90$

$+2 \quad +2$

$n = 92$

15. A number is multiplied by 2, and then the product is added to 9. The result is 49. What is the number?

$2n + 9 = 49$

$-9 \quad -9$

$\frac{2n}{2} = \frac{40}{2}$

$n = 20$