Solving One Step Equations

Example 1: Solve $x + 4 = 12$

$x + 4 = 12$

$x + 4 - 4 = 12 - 4$ Subtract 4 from each side of the equation to isolate the variable.

$x = 8$ Simplify.

Example 2: Solve $\dfrac{-2}{7}x = 4$

$\dfrac{-2}{7}x = 4$

$7 \cdot \dfrac{-2}{7}x = 4 \cdot 7$ Multiply each side of the equation by 7 to eliminate the denominator.

$-2x = 28$ Simplify.

$\dfrac{-2x}{-2} = \dfrac{28}{-2}$ Divide each side of the equation by -2 to isolate the variable.

$x = -14$ Simplify.

Solving Two Step Equations

Example 3: Solve $-5x - 3 = 17$

$-5x - 3 = 17$

$-5x - 3 + 3 = 17 + 3$ Add 3 to each side of the equation.

$-5x = 20$ Simplify.

$\dfrac{-5x}{-5} = \dfrac{20}{-5}$ Divide each side of the equation by -5.

$x = -4$ Simplify.

Example 4: Solve $-1 = \dfrac{5 + x}{6}$

$-1 = \dfrac{5 + x}{6}$

$6 \cdot -1 = \dfrac{5 + x}{6} \cdot 6$ Multiply each side of the equation by 6.

$-6 = 5 + x$ Simplify.

$-6 - 5 = 5 - 5 + x$ Subtract 5 from each side of the equation.

$-11 = x$ Simplify.

Example 5: Solve $-6 + \dfrac{x}{4} = -5$

$-6 + \dfrac{x}{4} = -5$

$-6 + 6 + \dfrac{x}{4} = -5 + 6$ Add 6 to each side of the equation.

$\dfrac{x}{4} = 1$ Simplify.

$4 \cdot \dfrac{x}{4} = 1 \cdot 4$ Multiply each side of the equation by 4.

$x = 4$ Simplify.

Solving Multi-step Equations

Example 6: Solve $-16-(6x-4)=6$

$$-16-(6x-4)=6$$

$-16-6x+4=6$	Distribute the -1 to both $6x$ and -4.
$-12-6x=6$	Simplify each side of the equation.
$-12+12-6x=6+12$	Add 12 to each side of the equation.
$-6x=18$	Simplify.
$\dfrac{-6x}{-6}=\dfrac{18}{-6}$	Divide each side of the equation by -6.
$x=-3$	Simplify.

Example 7: Solve $18-6x=-2(4x-5)$

$$18-6x=-2(4x-5)$$

$18-6x=-8x+10$	Distribute the -2 to both $4x$ and -5.
$18-6x+8x=-8x+8x+10$	Add $8x$ to each side of the equation.
$18+2x=10$	Simplify.
$18-18+2x=10-18$	Subtract 18 from each side of the equation.
$2x=-8$	Simplify.
$\dfrac{2x}{2}=\dfrac{-8}{2}$	Divide each side of the equation by -2.
$x=-4$	Simplify.