3.3 Solve Multi-Step Equations

Goal • Solve multi-step equations.

Your Notes

Example 1 *Solve an equation by combining like terms*

Solve $3t + 5t - 5 = 11$.

Solution

$3t + 5t - 5 = 11$ — **Write original equation.**

$8t - 5 = 11$ — **Combine like terms.**

$8t - 5 + 5 = 11 + 5$ — **Add 5 to each side.**

$8t = 16$ — **Simplify.**

$\frac{8t}{8} = \frac{16}{8}$ — **Divide each side by 8.**

$t = 2$ — **Simplify.**

The solution is 2.

Example 2 *Solve an equation using the distributive property*

Solve $5a + 3(a + 2) = 22$.

Solution

Method 1

Show All Steps

$5a + 3(a + 2) = 22$

$5a + 3a + 6 = 22$

$8a + 6 = 22$

$8a + 6 - 6 = 22 - 6$

$8a = 16$

$\frac{8a}{8} = \frac{16}{8}$

$a = 2$

Method 2

Do Some Steps Mentally

$5a + 3(a + 2) = 22$

$5a + 3a + 6 = 22$

$8a + 6 = 22$

$8a = 16$

$a = 2$

Your Notes

✔ ***Checkpoint*** **Solve the equation. Check your solution.**

1. $9d - 4d - 2 = 18$ $d = 4$	**2.** $2x + 7(x - 3) = 6$ $x = 3$
3. $3w + 4 + w = 36$ $w = 8$	**4.** $40 = 2(10 + 4k) + 2k$ $k = 2$

Example 3 ***Multiply by a reciprocal to solve an equation***

Solve $\frac{3}{4}(a - 5) = 9$.

Solution

$\frac{3}{4}(a - 5) = 9$ **Write original equation.**

$\left(\frac{4}{3}\right) \cdot \frac{3}{4}(a - 5) = \left(\frac{4}{3}\right) \cdot 9$ **Multiply each side by** $\frac{4}{3}$**.**

$a - 5 = 12$ **Simplify.**

$a - 5 + 5 = 12 + 5$ **Add** 5 **to each side.**

$a = 17$ **Simplify.**

✔ ***Checkpoint*** **Solve the equation. Check your solution.**

5. $\frac{1}{2}(4x - 2) = 7$ $x = 4$	**6.** $\frac{5}{6}(2y + 4) = 10$ $y = 4$

Homework