# 2.5 Solve Equations with Variables on Both Sides

## COLLECT VARIABLES ON SAME SIDE!

1. $7 - 8x = 4x - 17$

$+8x \quad +8x$

$7 = 12x - 17$

$+17 \quad +17$

$\frac{24}{12} = \frac{12x}{12}$

$2 = x$

2. $13 + 5g = 2g - 8$

$-2g \quad -2g$

$+13 + 3g = -8$

$-13 \quad -13$

$\frac{3g}{3} = \frac{-21}{3}$

$g = -7$

3. $\frac{3}{5}x + 3 = \frac{1}{5}x - 7$

$-\frac{1}{5}x \qquad -\frac{1}{5}x$

$\frac{2}{5}x + 3 = -7$

$-3 \qquad -3$

$\frac{2}{5}x = -10$

$\frac{\frac{2}{5}x}{\frac{2}{5}} = \frac{-10}{\frac{2}{5}}$

$x = -25$

4. $\frac{2}{5}n - 9 = 7 - \frac{3}{5}n$

$-\frac{2}{5}n \qquad -\frac{2}{5}n$

$-9 = 7 - 1n$

$-7 \qquad -7$

$\frac{-16}{-1} = \frac{-1n}{-1}$

$16 = n$

5. $8 - \frac{1}{2}p = +\frac{1}{4}p - 7$

$-\frac{1}{4}p \quad -\frac{1}{4}p$

$+8 \quad -\frac{3}{4}p = -7$

$-8 \quad -8$

$-\frac{3}{4}p = -15$

$-\frac{3}{4} \quad -\frac{3}{4}$

$p = 20$

6. $\frac{5}{6}x + 1 = \frac{1}{4} - \frac{1}{2}x$

$+\frac{1}{2}x \quad +\frac{1}{2}x$

$\frac{4}{3}x + 1 = \frac{1}{4}$

$-1 \quad -1$

$\frac{4}{3}x = -\frac{3}{4}$

$\frac{4}{3} \quad \frac{4}{3}$

$x = -\frac{9}{16}$

7. $9p - 5 = \frac{1}{4}(16p + 60)$

$9p - 5 = \frac{1}{4} \cdot 16p + \frac{1}{4} \cdot 60$

$9p - 5 = +4p + 15$

$-4p \quad -4p$

$5p - 5 = 15$

$+5 \quad +5$

$\frac{5p}{5} = \frac{20}{5}$

$p = 4$

8. $8y - 6 = \frac{2}{3}(6y + 15)$

$8y - 6 = \frac{2}{3} \cdot 6y + \frac{2}{3} \cdot 15$

$8y - 6 = +4y + 10$

$-4y \quad -4y$

$4y - 6 = 10$

$+6 \quad +6$

$\frac{4y}{4} = \frac{16}{4}$

$y = 4$

9. $3x + 2 = 1x + 5 + 2x$

$3x + 2 = +3x + 5$

$-3x \quad -3x$

$2 = 5$ ← False

no solution

10. $8 - 2(t + 1) = -3t + 1$

$8 \quad -2t \quad -2 = -3t + 1$

$6 \quad -2t = -3t + 1$

$+3t \quad +3t$

$+6 + 1t = 1$

$-6 \quad -6$

$\frac{1t}{1} = \frac{-5}{1}$

$t = -5$

11. $5 + 2(k + 4) = 5(k - 3) + 10$

$5 + 2k + 8 = 5k - 15 + 10$

$13 + 2k = 5k - 5$

$-2k \quad -2k$

$13 = 3k - 5$

$+5 \quad +5$

$\frac{18}{3} = \frac{3k}{3}$

$6 = k$

12. $2(h + 6) - 8 = 2h + 4$

$2h + 12 - 8 = 2h + 4$

$+2h + 4 = +2h + 4$

$-2h \quad -2h$

$4 = 4$ True

all real numbers