

Solving Equations with Variables on Both Sides

$$\begin{array}{r}
 1) -14 + 3r = 8r + 1 \\
 \underline{-3r \quad -3r} \\
 -14 = 5r + 1 \\
 \underline{-1 \quad -1} \\
 -15 = 5r \\
 \underline{\quad 5 \quad 5} \\
 -3 = r
 \end{array}$$

$$\begin{array}{r}
 6) -14 + 3r = 8r + 1 \\
 \underline{-8r \quad -8r} \\
 -14 - 5r = 1 \\
 \underline{+14 \quad +14} \\
 -5r = 15 \\
 \underline{-5 \quad -5} \\
 r = -3
 \end{array}$$

$$\begin{array}{r}
 2) 1 - 7n = 1 + 5n \\
 \underline{-5n \quad -5n} \\
 1 - 12n = 1 \\
 \underline{-1 \quad -1} \\
 -12n = 0 \\
 \underline{-12 \quad -12} \\
 n = 0
 \end{array}$$

$$\begin{array}{r}
 3) 32 + 4n = 4(7 + n) + 4 \\
 32 + 4n = 28 + 4n + 4 \\
 \underline{32 + 4n = 32 + 4n} \\
 -4n \quad -4n \\
 32 = 32
 \end{array}$$

Infinitely many solutions

$$\begin{array}{r}
 4) -43 - 6x = -6(x + 6) \\
 -43 - 6x = -6x + (-36) \\
 \underline{+6x \quad +6x} \\
 -43 = -36
 \end{array}$$

No solutions

Steps

- 1) Distribute
- 2) Combine Like Terms
- 3) move variables to one side
- 4) solve 2-step equation

$$\begin{array}{r}
 5) w - 5w = 2(2 - 3w) + 4(6 + 4w) \\
 w - 5w = 4 - 6w + 24 + 16w \\
 \underline{-4w \quad -4w} \\
 -10w = 28 + 10w \\
 \underline{-10w \quad -10w} \\
 -14w = 28 \\
 \underline{-14 \quad -14} \\
 w = -2
 \end{array}$$

$$\begin{array}{r}
 6) 6 - 2a - 3 = 2(4 + 5a) \\
 12a + 18 = 8 + 10a \\
 \underline{-10a \quad -10a} \\
 2a + 18 = 8 \\
 \underline{-18 \quad -18} \\
 2a = -10 \\
 \underline{2 \quad 2} \\
 a = -5
 \end{array}$$