

# UNIT 2: EQUATIONS & INEQUALITIES

Get rid of the variable term that is the least

Unit 2, Page 32

Objective: I can solve multi-step equations with variables on both sides.

## VARIABLE TERMS ON BOTH SIDES

To solve when you have variables on both sides, eliminate one of these terms by adding the opposite of it to both sides.

**Examples** Add -2x to both sides first Make sure that you only combine LIKE terms. Line them up accordingly.

$$\begin{array}{r}
 15 + 6 = 6 + 15 \\
 5x + 6 = 2x + 15 \\
 \underline{-2x} \quad \underline{-2x} \\
 3x + 6 = 15 \\
 \underline{-6} \quad \underline{-6} \\
 3x = 9 \\
 \underline{3} \quad \underline{3} \\
 x = 3
 \end{array}$$

$$\begin{array}{r}
 7x - 4 = 20 + 3x \\
 \underline{-3x} \quad \underline{-3x} \\
 4x - 4 = 20 \\
 \underline{+4} \quad \underline{+4} \\
 4x = 24 \\
 \underline{4} \quad \underline{4} \\
 x = 6
 \end{array}$$

$$\begin{array}{r}
 2x + 15 = -5x \\
 \underline{+5x} \quad \underline{+5x} \\
 7x + 15 = 0 \\
 \underline{-15} \quad \underline{-15} \\
 7x = -15 \\
 \underline{7} \quad \underline{7} \\
 x = -\frac{15}{7}
 \end{array}$$

Practice:

$$\begin{array}{r}
 3 + 9v + 13 = 4v \\
 \underline{-4v} \quad \underline{-4v} \\
 -1v + 16 = 0 \\
 \underline{-16} \quad \underline{-16} \\
 -1v = -16 \\
 \underline{1} \quad \underline{1} \\
 v = 16
 \end{array}$$

$$\begin{array}{r}
 2 + 2c + 50 = 8c \\
 \underline{-2c} \quad \underline{-2c} \\
 -50 + 52 = 6c \\
 \underline{2} \quad \underline{2} \\
 -48 = 6c \\
 \underline{6} \quad \underline{6} \\
 -8 = c
 \end{array}$$

$$\begin{array}{r}
 -m - 20 = 5m + 4 \\
 \underline{+7m} \quad \underline{+7m} \\
 -6m - 20 = 4 \\
 \underline{+20} \quad \underline{+20} \\
 -6m = 24 \\
 \underline{-6} \quad \underline{-6} \\
 m = -4
 \end{array}$$

$$\begin{array}{r}
 27 + 11x = 1x \\
 \underline{-11x} \quad \underline{-11x} \\
 27 = -10x \\
 \underline{-27} \quad \underline{-27} \\
 -10x = -27 \\
 \underline{10} \quad \underline{10} \\
 x = 2.7
 \end{array}$$

$$\begin{array}{r}
 21z + 6 = -26 \\
 \underline{-17z} \quad \underline{-17z} \\
 4z + 6 = -26 \\
 \underline{-6} \quad \underline{-6} \\
 4z = -32 \\
 \underline{4} \quad \underline{4} \\
 z = -8
 \end{array}$$

$$\begin{array}{r}
 11x - 8x = -6 \\
 \underline{-8x} \quad \underline{-8x} \\
 3x = -6 \\
 \underline{3} \quad \underline{3} \\
 x = -2
 \end{array}$$

Write an equation and solve. (let "x" = the number)

7. Twenty decreased by 2 times a number is the same as 10 less than 3 times the number. Find the number.

$$\begin{array}{r}
 20 - 2(6) \\
 20 - 12 \\
 \underline{8} \\
 \text{check}
 \end{array}$$

Equation:  $20 - 2x = 3x - 10$

Solve: 
$$\begin{array}{r}
 20 - 2x = 3x - 10 \\
 \underline{+2x} \quad \underline{+2x} \\
 20 = 5x - 10 \\
 \underline{+10} \quad \underline{+10} \\
 30 = 5x \\
 \underline{5} \quad \underline{5} \\
 6 = x
 \end{array}$$

$$\begin{array}{r}
 3(6) - 10 \\
 18 - 10 \\
 \underline{8} \\
 \text{check}
 \end{array}$$

$6 = x$