

Unit 1: Linear Equations

Day 4: Equations with Brackets

Today we will...

1. Learn how to solve a linear equation that has variables on both sides of the equation.
2. Review expanding brackets.
3. Learn how to expand brackets to solve linear equations

Solving Equations with more than
One Variable

Example 1: Solve the following:

a) $2x + 5 = 6 + x$

$$2x - x + 5 = 6$$

$$x + 5 = 6$$

$$x = 6 - 5$$

$$x = 1$$

b) $7 - 5x = 2x - 14$

$$7 - 5x - 2x = -14$$

$$7 - 7x = -14$$

$$-7x = -14 - 7$$

$$-7x = -21$$

$$\frac{-7x}{-7} = \frac{-21}{-7}$$

$$x = 3$$

Solving Equations with Brackets

Review: Expand the following.

$$\begin{aligned} \text{a) } & 3(x + 2) \\ & = 3x + 6 \end{aligned}$$

$$\begin{aligned} \text{b) } & 5(-x + 1) \\ & = -5x + 5 \end{aligned}$$

$$\begin{aligned} \text{c) } & -4(k - 1) \\ & = -4k + 4 \end{aligned}$$

Example 1: Solve the following and check by substitution:

$$\begin{aligned} \text{a) } & 2(x + 9) = 16 \\ & 2x + 18 = 16 \\ & 2x = 16 - 18 \\ & 2x = -2 \\ & \frac{2x}{2} = \frac{-2}{2} \\ & x = -1 \end{aligned}$$

Edit
Reset

?

- 1 Expand the brackets.
- 2 Collect like terms.
- 3 Solve for the variable

Left Side L.S.	Right Side R.S.
Check: → to see if $x = -1$ works in the equation	$2(x + 9)$ $= 2(-1 + 9)$ $= 2(8)$ $= 16$

If $LS = RS$, the
value for x works

Since $LS = RS$,
 $\therefore x = -1$

Example 2: Solve the following equations.

$$a) 4(k-3) = 6 - 1(2k-6)$$

$$4k - 12 = 6 - 2k + 6$$

$$4k - 12 = -2k + 12$$

$$4k + 2k - 12 = 12$$

$$6k - 12 = 12$$

$$6k = 12 + 12$$

$$\frac{6k}{6} = \frac{24}{6}$$

$$k = 4$$

Step 1: Eliminate the brackets

Step 2: Collect Like Terms

Step 3: Solve for k

$$b) 2(x+7) = 4$$

$$2x + 14 = 4$$

$$2x = 4 - 14$$

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

$$x = -5$$

$$c) 3(2x-1) - 2(x+1) = 5$$

$$6x - 3 - 2x - 2 = 5$$

$$6x - 2x - 3 - 2 = 5$$

$$4x - 5 = 5$$

$$4x = 5 + 5$$

$$\frac{4x}{4} = \frac{10}{4}$$

$$x = \frac{10}{4} = \frac{5}{2} = 2.5$$

Practice Work
Pages 169 - 170
#2a)d) and check, # 4 (check not required)