

Chapter 6: Graphing and solving linear relations

CH 6.4 - Modelling and solving two step equations

Vocabulary

Distributive Property - multiply the coefficient by everything inside the brackets.

Ex. $2(x + 3) \rightarrow (2) \cdot (x) + (2) \cdot (3) \rightarrow 2x + 6$

Solving equations in the form:

$$y = a(x + b)$$

Method 1 - Divide first

Find the product of the two polynomials

$$\begin{array}{r} 2(x + 4) = -8 \\ \underline{2} \quad \underline{2} \\ x + 4 = -4 \\ \underline{-4} \quad \underline{-4} \\ x = -8 \end{array}$$

Verify

$$\begin{array}{l} 2(-8 + 4) = -8 \\ 2(-4) = -8 \\ -8 = -8 \checkmark \end{array}$$

Key Points

- Divide both sides of the equation by the coefficient
- Solve for the unknown variable
- **Verify by substitution**

Visualization

$$2(x + 4) = -8$$

↳ two groups of

■ = positive
■ = negative

The coefficient tells us how many groups we have of whatever is in the brackets

Dividing by the coefficient allows us to see what just one of those groups are equal to

zero pair.

$$-1 + 1 = 0$$

Try it out:

$$-2(x - 3) = 12 \quad x = 9$$

subtract +4 or add -4

$$20 = 5(3 + p) \quad p = 1$$

Method 1 - Use distributive property

Find the product of the two polynomials

$$3(x - 5) = -6$$

$$(3)(x) - (3)(5) = -6$$

$$3x - 15 = -6$$
$$\quad +15 \quad +15$$

$$\frac{3x}{3} = \frac{9}{3}$$

$$x = 3$$

Try it out:

$$-2(x - 3) = 12 \quad x = 9$$

3 groups of $x - 5$
 $(x - 5) + (x - 5) + (x - 5)$
 $= 3x - 15.$

Verify

$$3(3 - 5) = -6$$

$$3(-2) = -6$$

$$-6 = -6 \quad \checkmark$$

Key Points

- Multiply everything in the brackets by the coefficient
- Solve for the unknown variable
 - Undo everything that was done to the variable in **reverse order of operations**
- Verify by substitution

$$24 = 3(6 + p) \quad p = 2$$

Benefits and Limitations of each method

Method 1: Divide by coefficient

Benefits

- simplifies problem very quickly.

Limitations

- only works well if both sides share a common factor.
ie. the value on the other side of the equals sign must be divisible by the coefficient

Method 2: Distributive property

Benefits.

- works for any problem.
"Ye ole faithful"

Limitations

- tend to have larger values to deal with after you distribute.

Practice Assignment

- worksheet provided in class
- If not in class: page 211 # 1, 2, 5, 6, choose 2 apply questions