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Linear Equations

Solutions & Answer Key

Full worked solutions, marking scheme & answer key

IGCSE Mathematics

The Panda Math Tutor

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Companion to the *Student Worksheet*

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Note

About this booklet. These are the complete solutions to every question in the *Linear Equations — Student Worksheet*. Question numbers match exactly (OS1–OS7, TS1–TS7, BR1–BR7, FR1–FR7, BS1–BS7, WP1–WP7, the Mixed Review MR1–MR10, and the examination questions Q1–Q8).
Every solution shows one operation per line, names that operation in brackets on the right, and finishes with a substitution check — exactly the layout you should reproduce in an examination. Part V collects the common mistakes to watch for, and Part VI is a quick answer key for fast marking.

4 Part IV — Complete Solutions

Note

Each solution follows the pattern from the notes: apply the *inverse* operation to *both* sides, one step at a time, until the variable is isolated — then check by substituting back into the original equation.

4.1 Solutions — One-Step Equations

Solution OS1

The inverse of "+14" is "−14":

$$\begin{aligned} x + 14 &= 23 \\ x &= 23 - 14 \qquad \text{(subtract 14 from both sides)} \\ x &= 9 \end{aligned}$$

Check: $9 + 14 = 23$ ✓

Solution OS2

The inverse of "−8" is "+8":

$$\begin{aligned} y - 8 &= 17 \\ y &= 17 + 8 \qquad \text{(add 8 to both sides)} \\ y &= 25 \end{aligned}$$

Check: $25 - 8 = 17$ ✓

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Solution OS3

The inverse of "×6" is "÷6":

$$\begin{aligned} 6m &= 54 \\ m &= \frac{54}{6} && \text{(divide both sides by 6)} \\ m &= 9 \end{aligned}$$

Check: $6 \times 9 = 54$ ✓

Solution OS4

The inverse of "÷5" is "×5":

$$\begin{aligned} \frac{n}{5} &= 12 \\ n &= 12 \times 5 && \text{(multiply both sides by 5)} \\ n &= 60 \end{aligned}$$

Check: $\frac{60}{5} = 12$ ✓

Solution OS5

$$\begin{aligned} p + 3.5 &= 9.2 \\ p &= 9.2 - 3.5 && \text{(subtract 3.5 from both sides)} \\ p &= 5.7 \end{aligned}$$

Check: $5.7 + 3.5 = 9.2$ ✓

Solution OS6

Here the unknown is being *subtracted*, so add w to both sides to make it positive:

$$\begin{aligned} 15 - w &= 4 \\ 15 &= 4 + w && \text{(add } w \text{ to both sides)} \\ 15 - 4 &= w && \text{(subtract 4 from both sides)} \\ w &= 11 \end{aligned}$$

Inverse operations used: addition, then subtraction.
Check: $15 - 11 = 4$ ✓

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