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Measurements

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 *Measurements — Student Worksheet*. Question numbers match exactly (U1–U7, AV1–AV7, S1–S7, D1–D7, B1–B7, A1–A6, the Mixed Review MR1–MR10, and the examination questions Q1–Q8).
Each solution follows the notes' reasoning pattern — identify what is given, state what is required, choose the formula *and say why it fits*, substitute, then check the answer and its units. Depth is scaled to difficulty. 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 same reasoning pattern used in the notes: identify what is given, decide what is required, choose the method *and say why it fits*, work through it, then check. Depth is scaled to difficulty — brief for basic questions, fuller for harder ones.

4.1 Solutions — Units and Conversions

Solution U1

Decide each time whether the new unit is *smaller* (multiply) or *larger* (divide).
(a) km → m is a smaller unit, so multiply by 1000:

$$3.7 \times 1000 = 3700 \text{ m}.$$

(b) cm → m is a larger unit, so divide by 100:

$$480 \div 100 = 4.8 \text{ m}.$$

(c) ml → litres is a larger unit, so divide by 1000:

$$6250 \div 1000 = 6.25 \text{ litres}.$$

Solution U2

(a) $2.4 \times 1000 = 2400\,\text{kg}$. **(b)** $7500 \div 1000 = 7.5\,\text{kg}$. **(c)** $0.85 \times 1000 = 850\,\text{mg}$.
Notice the pattern: tonne → kg → g → mg each use a factor of 1000.

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Solution U3

(a) 1 litre $= 1000\,\text{cm}^3$, so $3.6 \times 1000 = 3600\,\text{cm}^3$.
(b) $1\,\text{m}^3 = 1\,000\,000\,\text{cm}^3$, so

$$45\,000 \div 1\,000\,000 = 0.045\ \text{m}^3.$$

(c) $1\,\text{m}^3 = 1000$ litres, so $2.5 \times 1000 = 2500$ litres.

Solution U4

(a) 4 hours $= 4 \times 60 = 240$ minutes, so the total is $240 + 24 = 264$ minutes.
(b) Convert only the minutes part into a fraction of an hour:

$$4 + \frac{24}{60} = 4 + 0.4 = 4.4 \text{ hours}.$$

(c) $264 \times 60 = 15\,840$ seconds.
Common error: writing 4 hours 24 minutes as 4.24 hours. The minutes must be divided by 60 first.

Solution U5

Choose the method: the two lengths are in different units, so convert before dividing.

$$2.4\ \text{m} = 2.4 \times 100 = 240\ \text{cm}.$$

$$\text{Number of pieces} = 240 \div 15 = 16.$$

Answer: 16 **pieces.** **Check:** $16 \times 15 = 240\,\text{cm} = 2.4\,\text{m}$. ✓

Solution U6

(a) $45 \times 1.6 = 72\,\text{km}$.
(b) $30 \times 2.54 = 76.2\,\text{cm}$.
(c) $5 \times 30.5 = 152.5\,\text{cm}$.
In each case the imperial unit is the *larger* one, so we multiply to obtain the metric value.

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