Worked answers | Pythagoras' theorem

Exact roots versus rounded answers

6 questions | 13 marks

Equivalent correct methods earn the corresponding marks.

1. Legs are 2 cm and 3 cm. Give the exact hypotenuse. [2 marks]

Add squares: 4 + 9 = 13.

Take the positive root without rounding.

Answer: $\sqrt{13}$ cm.

2. Hypotenuse 6 cm, leg 4 cm: give the other leg exactly. [2 marks]

Subtract squares: 36 - 16 = 20.

Take the positive root.

Answer: $\sqrt{20}$ cm.

3. Between which integers is $\sqrt{41}$? [2 marks]

The neighbouring squares are 36 and 49.

41 lies between them.

Answer: 6 and 7.

4. A calculator gives 9.433981 for a length in metres. Round to 2 decimal places. [2 marks]

The third decimal digit is 3.

Keep the hundredths digit unchanged.

Answer: 9.43 m.

5. A calculator gives 6.0827625 for a length in centimetres. Round to 1 decimal place. [2 marks]

The second decimal digit is 8.

Round the tenths digit up.

Answer: 6.1 cm.

6. For legs 5 cm and 7 cm, a calculator gives $\sqrt{74} = 8.602325\ldots$. Give the exact answer, the answer to 2 decimal places, and an integer-bound check. [3 marks]

The squared sum is 74.

Use $64 < 74 < 81$ for the bounds, then round the supplied value.

Answer: $\sqrt{74}$ cm; approximately 8.60 cm; between 8 and 9.