# Pythagoras' Theorem

Class 9–10 Maths · Classes 8–10 · CBSE and ICSE · About 25 minutes · 8 questions

Name _____ Date _____ Score / 8

**WHAT YOU WILL PRACTISE**

- Find the hypotenuse of a right-angled triangle
- Find a shorter side of a right-angled triangle
- Apply Pythagoras' theorem to worded and coordinate problems

**WORKED EXAMPLE**

A right-angled triangle has a hypotenuse of 13 cm and one shorter side of 5 cm. Find the other side.

1. Write the theorem: $a^2 + b^2 = c^2$, where c is the hypotenuse.
2. Substitute: $a^2 + 5^2 = 13^2$, so $a^2 + 25 = 169$.
3. Subtract: $a^2 = 144$.
4. Square root: $a = 12$.

**Answer:** 12 cm

## Questions

Show your working in the space under each question.

**1.** The two shorter sides of a right-angled triangle are 6 cm and 8 cm. Find the hypotenuse.

**2.** The two shorter sides of a right-angled triangle are 5 cm and 12 cm. Find the hypotenuse.

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**3.** A right-angled triangle has a hypotenuse of 15 cm and one shorter side of 9 cm. Find the other shorter side.

**4.** The two shorter sides of a right-angled triangle are 7 cm and 9 cm. Find the hypotenuse to 1 decimal place.

**5.** A right-angled triangle has a hypotenuse of 14 cm and one shorter side of 8 cm. Find the other shorter side to 1 decimal place.

**6.** A 5 m ladder leans against a vertical wall. The foot of the ladder is 1.5 m from the wall. How far up the wall does the ladder reach? Give your answer to 2 decimal places.

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**7.** A triangle has sides of 9 cm, 40 cm and 41 cm. Is it a right-angled triangle? Show your working.

**8.** Find the distance between the points (1, 2) and (7, 10).

# Answers: Pythagoras' Theorem

Mark your own work, then go back to any question you got wrong before reading the tutor tip.

| Q | QUESTION | ANSWER |
|---|---|---|
| 1 | The two shorter sides of a right-angled triangle are 6 cm and 8 cm. Find the hypotenuse. | **10 cm** |
| 2 | The two shorter sides of a right-angled triangle are 5 cm and 12 cm. Find the hypotenuse. | **13 cm** |
| 3 | A right-angled triangle has a hypotenuse of 15 cm and one shorter side of 9 cm. Find the other shorter side. | **12 cm** |
| 4 | The two shorter sides of a right-angled triangle are 7 cm and 9 cm. Find the hypotenuse to 1 decimal place. | **11.4 cm** |
| 5 | A right-angled triangle has a hypotenuse of 14 cm and one shorter side of 8 cm. Find the other shorter side to 1 decimal place. | **11.5 cm** |
| 6 | A 5 m ladder leans against a vertical wall. The foot of the ladder is 1.5 m from the wall. How far up the wall does the ladder reach? Give your answer to 2 decimal places. | **4.77 m** |
| 7 | A triangle has sides of 9 cm, 40 cm and 41 cm. Is it a right-angled triangle? Show your working. | **Yes, because $9^2 + 40^2 = 81 + 1600 = 1681 = 41^2$** |
| 8 | Find the distance between the points (1, 2) and (7, 10). | **10 units** |

**TUTOR TIP**

Add the squares to find the hypotenuse and subtract to find a shorter side. The hypotenuse must be the longest side, so use that to sense-check your answer.

**Stuck on a question? Work through it live with a tutor.**

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