Pythagoras' Theorem

GCSE Maths · Foundation and Higher tier · Grades 4–6 · 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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