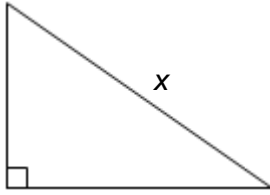


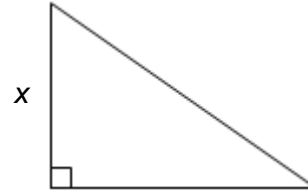
## Foundation Check In - 10.05a Pythagoras' theorem

Calculate the missing side  $x$  in each of these triangles.

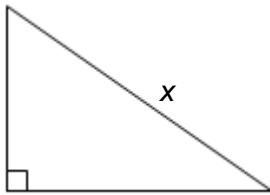
1.



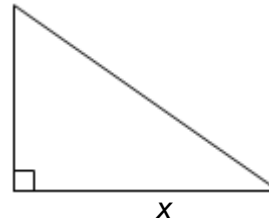
2.



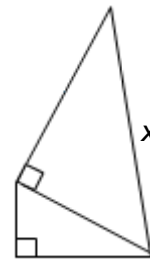
3.



4.



- Find the length of the diagonal of a square with sides 4 cm.
- Explain why a triangle with sides 12 cm, 16 cm and 20 cm is a right-angled triangle.
- A rectangular field is 45 metres long and 30 metres wide. Ian walks diagonally across the field. Show that the distance he walks is 54 metres correct to the nearest metre.
- Explain why the missing side  $x$  is equal to 13 cm.



- A ship sails 20 km west from a harbour, and then changes direction and sails 30 km south. What is the shortest distance the ship needs to travel to return to the harbour?
- Find the area of an equilateral triangle with sides 6 cm.



# GCSE (9-1) MATHEMATICS

## Extension

A Pythagorean Triple is a set of three numbers where the sum of the squares of two numbers is equal to the square of the third number, e.g. 3, 4, 5 is a Pythagorean Triple because  $3^2 + 4^2 = 5^2$ .

Complete the table below for Pythagorean Triples.

Side a	Side b	Side c
3	4	5
5	12	
7	24	
9		
11		



# GCSE (9–1) MATHEMATICS

## Answers

- 15 cm
- 5 cm
- 49.7 cm
- 26.6 cm
- 5.7 cm
- Because the side lengths fit Pythagoras' theorem:  $12^2 + 16^2 = 20^2$ .
- $45^2 + 30^2 = 2925$   
 $\sqrt{2925} = 54.08 = 54$  m
- $\sqrt{3^2 + 4^2} = 5$   
 $\sqrt{5^2 + 12^2} = 13$
- 36.1 km
- 15.6 cm<sup>2</sup>

## Extension

Side a	Side b	Side c
3	4	5
5	12	13
7	24	25
9	40	41
11	60	61
13	84	85
15	112	113
17	144	145

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Assessment Objective	Qu.	Topic	R	A	G
AO1	1	Find hypotenuse using Pythagoras' theorem			
AO1	2	Find short side using Pythagoras' theorem			
AO1	3	Find hypotenuse using Pythagoras' theorem			
AO1	4	Find one of the shorter sides using Pythagoras' theorem			
AO1	5	Find diagonal length of a square			
AO2	6	Apply Pythagoras' theorem			
AO2	7	Check diagonal length of a rectangle			
AO2	8	Apply Pythagoras' theorem			
AO3	9	Use Pythagoras' theorem in context			
AO3	10	Use Pythagoras' theorem to solve a problem			

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