4.9 Pythagoras: 1-hour Pack

EDEXCEL 1MA1 · Calculator allowed · about 60 minutes

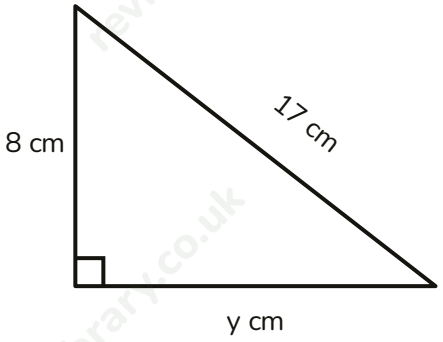
Total Marks

Name: _____ Date: ____ / ____ / _____

Answer ALL questions. Show all your working.

1 A right-angled triangle has a hypotenuse of length 17 cm and one shorter side of length 8 cm. Work out the length of the third side.

Diagram NOT accurately drawn

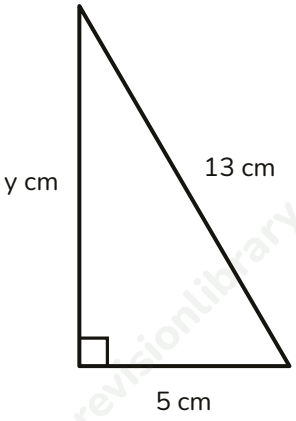


(Total for Question 1 is 2 marks)

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2 A right-angled triangle has a hypotenuse of length 13 cm and one shorter side of length 5 cm.
Work out the length of the third side.

Diagram NOT accurately drawn

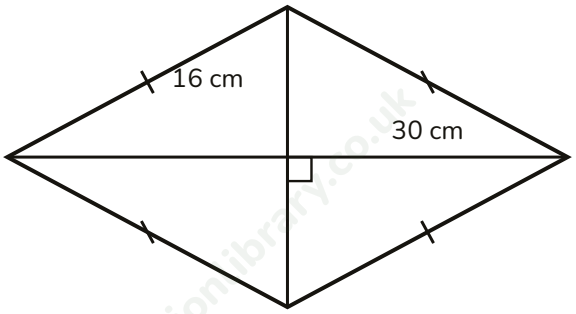


(Total for Question 2 is 2 marks)

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3 A rhombus has diagonals of length 16 cm and 30 cm. The diagonals of a rhombus bisect each other at right angles.

Diagram NOT accurately drawn



(a) State the lengths of the two half-diagonals formed where the diagonals cross. **(1)**

(b) Calculate the length of one side of the rhombus. **(3)**

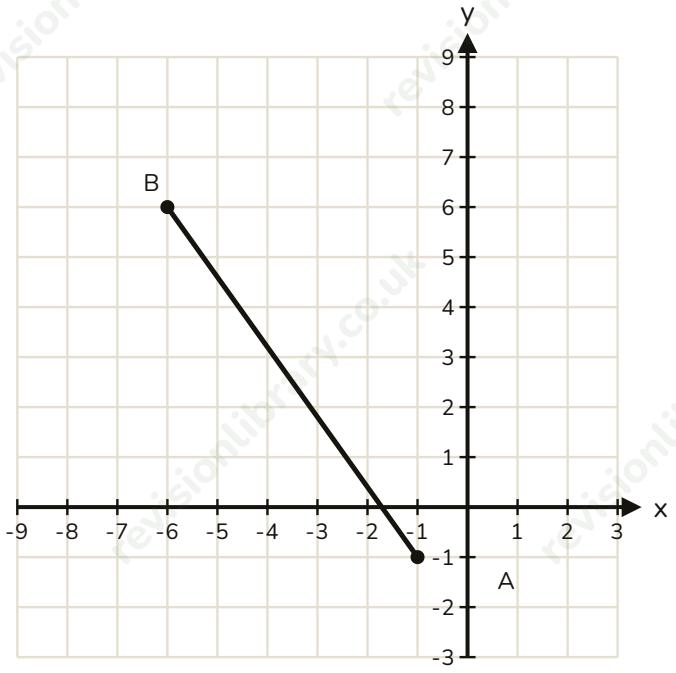
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(Total for Question 3 is 4 marks)

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4 A is the point (-1, -1) and B is the point (-6, 6).

Work out the length of the line AB. Give your answer correct to 3 significant figures.

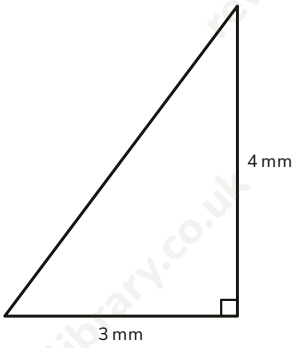


(Total for Question 4 is 3 marks)

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5 A right-angled triangle has shorter sides of length 3 mm and 4 mm.
Work out the length of the hypotenuse.

Diagram NOT accurately drawn

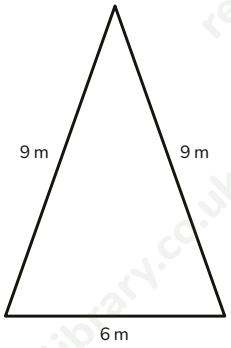


(Total for Question 5 is 2 marks)

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6 An isosceles triangle has a base of 6 m and two equal sides of 9 m.
Work out the area of the triangle. Give your answer correct to 3 significant figures.

Diagram NOT accurately drawn

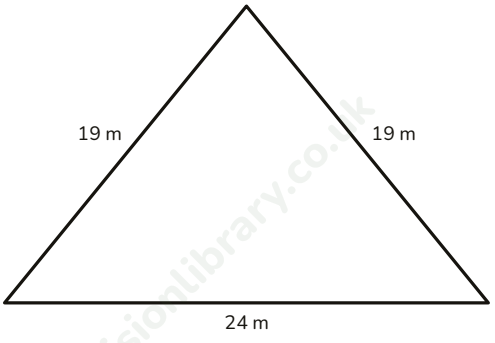


(Total for Question 6 is 4 marks)

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7 An isosceles triangle has a base of 24 m and two equal sides of 19 m.
Work out the area of the triangle. Give your answer correct to 3 significant figures.

Diagram NOT accurately drawn

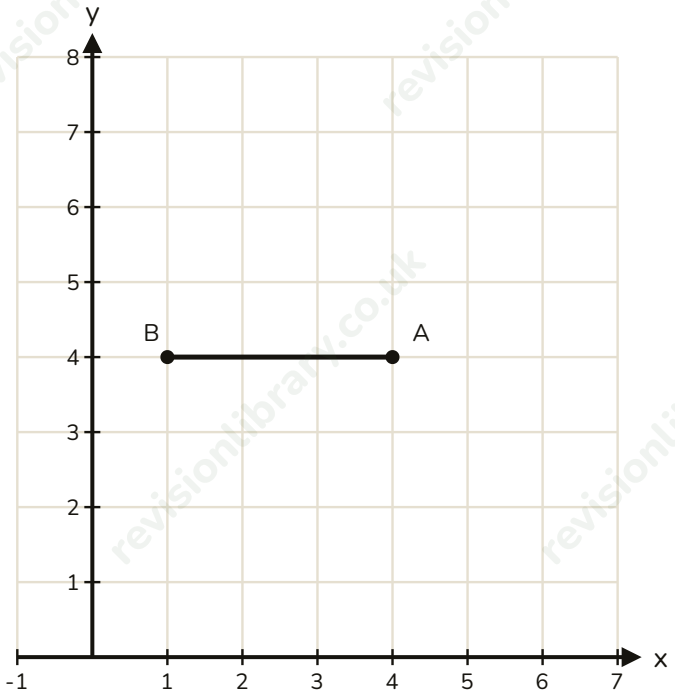


(Total for Question 7 is 4 marks)

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8 A is the point (4, 4) and B is the point (1, 4).

Work out the length of the line AB. Give your answer correct to 3 significant figures.



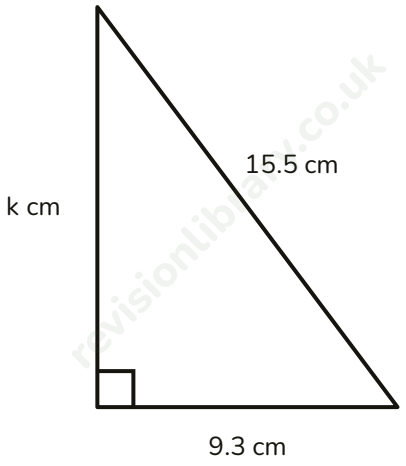
(Total for Question 8 is 3 marks)

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9 A right-angled triangle has a hypotenuse of length 15.5 cm and one shorter side of length 9.3 cm.

Work out the length of the third side.

Diagram NOT accurately drawn



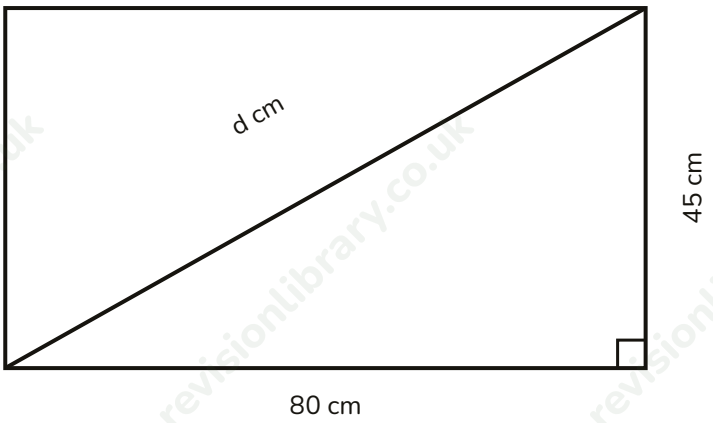
Not to scale

(Total for Question 9 is 3 marks)

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10 A rectangular television screen has width 80 cm and height 45 cm.
Calculate the length of the diagonal of the screen, d. Give your answer correct to 3 significant figures.

Diagram NOT accurately drawn

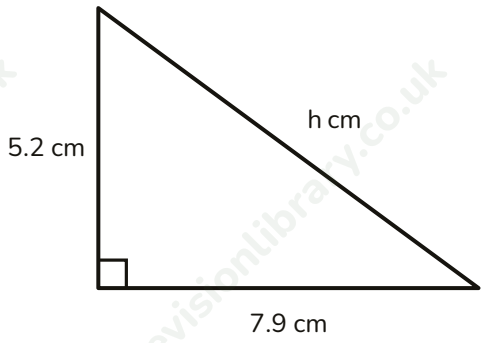


(Total for Question 10 is 3 marks)

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11 A right-angled triangle has two shorter sides of length 5.2 cm and 7.9 cm.
Calculate the length of the hypotenuse. Give your answer correct to 1 decimal place.

Diagram NOT accurately drawn

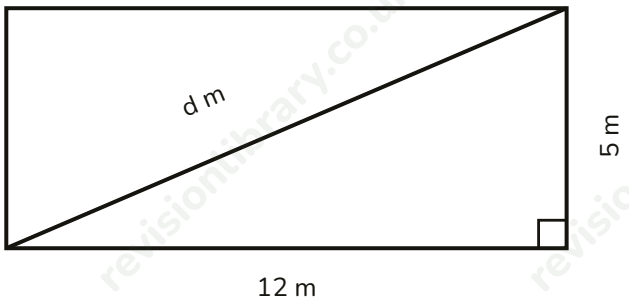


(Total for Question 11 is 3 marks)

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12 A rectangular gate measures 12 m wide by 5 m tall, with a diagonal metal brace fitted from one corner to the other.
Calculate the length of the diagonal brace, d.

Diagram NOT accurately drawn

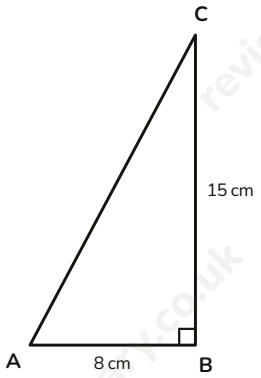


(Total for Question 12 is 2 marks)

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13 Work out the length of the hypotenuse of a right-angled triangle with legs 8 cm and 15 cm.

Diagram NOT accurately drawn



(Total for Question 13 is 1 mark)

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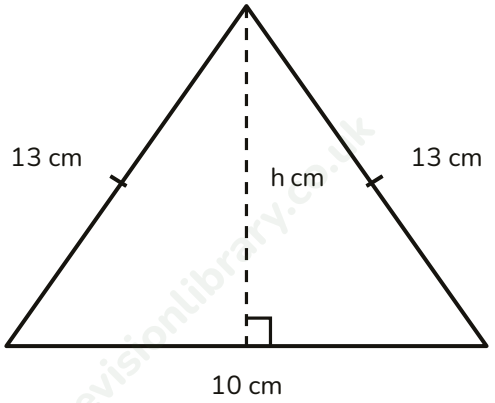
14 A square field has diagonal length 26 m. Work out the side length of the square.

(Total for Question 14 is 2 marks)

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15 An isosceles triangle has two equal sides of length 13 cm and a base of length 10 cm. A line is drawn from the apex perpendicular to the base, meeting the base at its midpoint.

Diagram NOT accurately drawn



(a) State the lengths of the two parts the base is split into by the perpendicular line, and explain why they are equal. **(1)**

(b) Calculate the perpendicular height, h, of the triangle. **(3)**

(Total for Question 15 is 4 marks)

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16 Point A has coordinates (1, 2) and point B has coordinates (4, 6).
Work out the distance AB.

(Total for Question 16 is 3 marks)

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17 A ramp rises 1.20 m from the ground to a doorway and the base of the ramp is 4.00 m from the doorway. Find the length of the ramp. Give your answer to 2 decimal places.

(Total for Question 17 is 3 marks)

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Mark scheme · 4.9 Pythagoras: 1-hour Pack

Question 1

$\sqrt{17^2 - 8^2}$ oe	**M1**
15 cm cao	**A1**

Answer: 15 cm

Question 2

$13^2 - 5^2$ oe (= 144)	**M1**
12 cm cao	**A1**

Answer: 12 cm

Question 3

(a) 8 cm and 15 cm cao	**B1**

(a) Answer: 8 cm and 15 cm

(b) $\sqrt{8^2 + 15^2}$ oe	**M1**
(b) $\sqrt{289}$	**A1**
(b) 17 cm cao	**A1**

(b) Answer: 17 cm

Question 4

horizontal 5 and vertical 7 differences	**M1**
$\sqrt{25 + 49}$	**M1**
8.60	**A1**

Answer: 8.60

Question 5

$3^2 + 4^2 = 25$	**M1**
5 mm	**A1**

Answer: 5 mm

Question 6

half the base 3	**M1**
height = $\sqrt{9^2 - 3^2}$	**M1**
area = 1/2 x base x height	**M1**
25.5 m²	**A1**

Answer: 25.5 m^2

Question 7

half the base 12	**M1**
height = $\sqrt{19^2 - 12^2}$	**M1**
area = 1/2 x base x height	**M1**
177 m²	**A1**

Answer: 177 m^2

Question 8

horizontal 3 and vertical 0 differences	**M1**
$\sqrt{9 + 0}$	**M1**
3.00	**A1**

Answer: 3.00

Question 9

$15.5^2 - 9.3^2$ oe (= 153.76)	**M1**
$\sqrt{\text{their } 153.76}$	**M1**
12.4 cm cao	**A1**

Answer: 12.4 cm

Question 10

$80^2 + 45^2$ oe (= 8425)	**M1**
$\sqrt{\text{their } 8425}$	**M1**
awrt 91.8 cm	**A1**

Answer: 91.8 cm (3 s.f.)

Question 11

$5.2^2 + 7.9^2$ oe (= 89.45)	**M1**
$\sqrt{\text{their } 89.45}$	**M1**
awrt 9.5 cm	**A1**

Answer: 9.5 cm (1 d.p.)

Question 12

$12^2 + 5^2$ oe (= 169)	**M1**
13 m cao	**A1**

Answer: 13 m

Question 13

17 cm cao	**B1**

Answer: 17 cm

Question 14

use 2 x $side^2 = 26^2$ or $side^2 = 26^2 / 2$ oe	**M1**
side = $26 / \sqrt{2} = 13*\sqrt{2}$ (accept 18.4 or awrt 18.38)	**A1**

Answer: $13*\sqrt{2}$ m (18.4 m)

Question 15

(a) 5 cm and 5 cm, because the perpendicular from the apex of an isosceles triangle bisects the base by symmetry oe	**B1**

(a) Answer: 5 cm and 5 cm

(b) $13^2 - 5^2$ oe (= 144)	**M1**
(b) $\sqrt{\text{their } 144}$	**M1**
(b) 12 cm cao	**A1**

(b) Answer: 12 cm

Question 16

$(4-1)^2 + (6-2)^2$ oe (= 25)	**M1**
$\sqrt{\text{their } 25}$	**M1**
5 cao	**A1**

Answer: 5

Question 17

use method: $length^2 = 1.20^2 + 4.00^2$ or show 1.44 + 16.00	**M1**
calculate length = $\sqrt{17.44}$ using a calculator	**M1**
4.18 m awrt	**A1**

Answer: 4.18 m

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