Name: _____

GCSE (1 – 9)

Pythagoras

Instructions

• Use **black** ink or ball-point pen.
• Answer all Questions.
• Answer the Questions in the spaces provided
– *there may be more space than you need.*
• Diagrams are **NOT** accurately drawn, unless otherwise indicated.
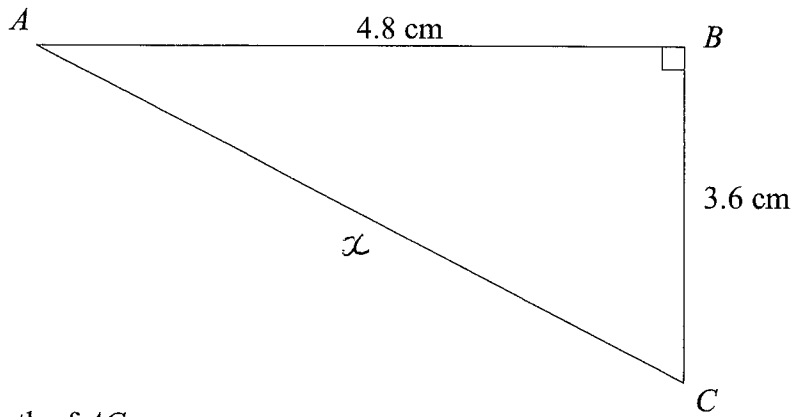• You must **show all your working out.**

Information

• The marks for each Question are shown in brackets
– *use this as a guide as to how much time to spend on each Question.*

Advice

• Read each Question carefully before you start to answer it.
• Keep an eye on the time.
• Try to answer every Question.
• Check your answers if you have time at the end

1

A ———— 4.8 cm ———— B ⌐

3.6 cm

x

C

Calculate the length of *AC*.

$$3.6^2 + 4.8^2 = x^2$$

$$36 = x^2$$

$$x = \sqrt{36}$$

$$= 6$$

.................................6.................................cm

(Total for question 1 is 3 marks)

2

x

A ⌐ ———— B

6.75 cm   17.55 cm

C
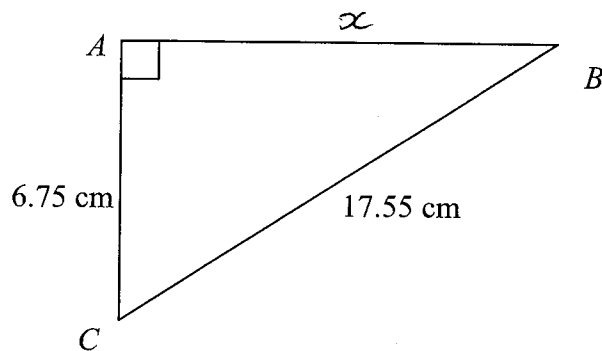
Calculate the length of ~~BC~~.
AB

$$x^2 + 6.75^2 = 17.55^2$$

$$x^2 = 17.55^2 - 6.75^2$$

$$x^2 = 262.44$$

$$x = \sqrt{262.44}$$

$$= 16.2$$

.................................16.2.................................cm

(Total for question 2 is 3 marks)

3

A

6 cm

14 cm

B

C

x
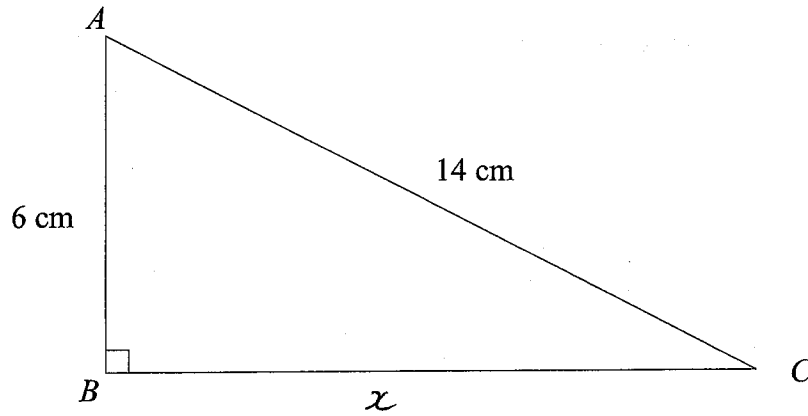
Calculate the length of BC.
Give your answer to 1 decimal place.

$$x^2 + 6^2 = 14^2$$
$$x^2 = 14^2 - 6^2$$
$$x^2 = 160$$
$$x = \sqrt{160}$$
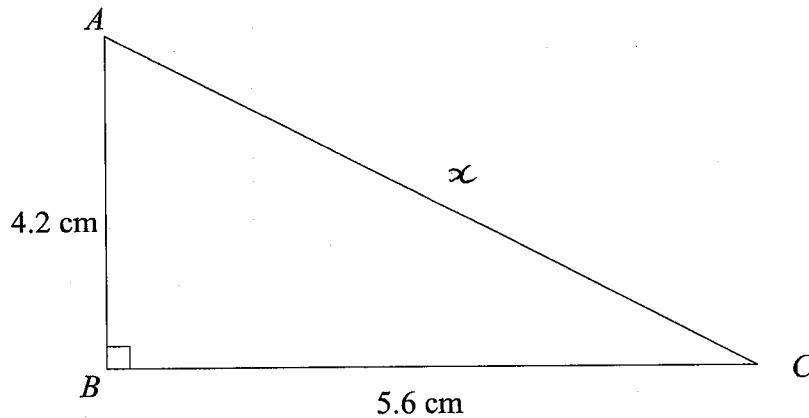$$= 12.6 \ (1dp)$$

............12.6............cm

(Total for question 3 is 3 marks)

4

A

4.2 cm

x

B

5.6 cm

C

Calculate the length of AC.
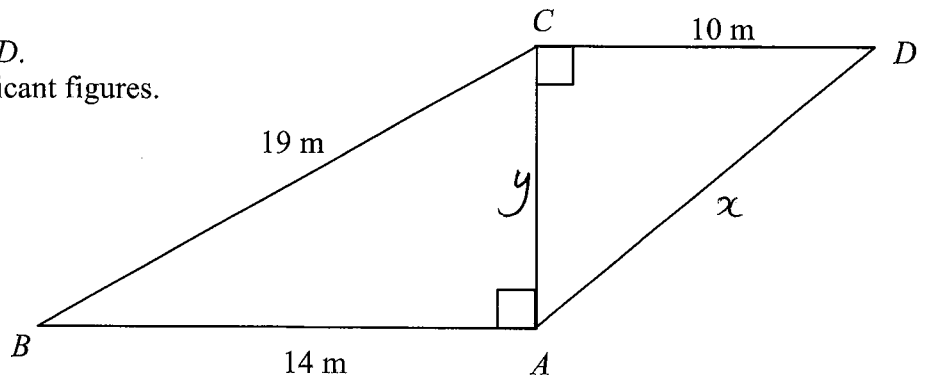
$$4.2^2 + 5.6^2 = x^2$$
$$49 = x^2$$
$$x = \sqrt{49}$$
$$= 7$$

............7............cm

(Total for question 4 is 3 marks)

5 Calculate the length of the AD.
Give your answer to 3 significant figures.

C ———10 m——— D

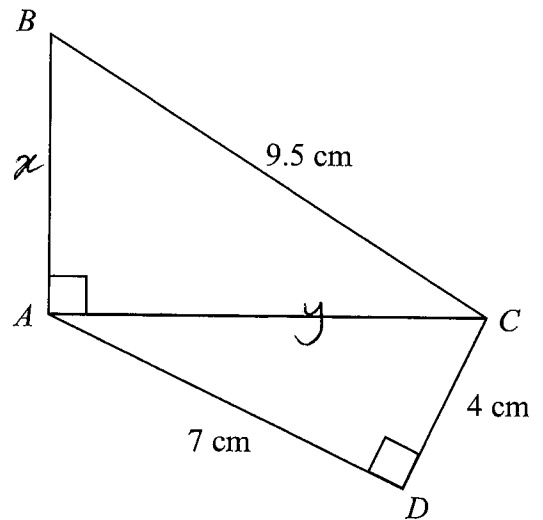19 m

y

B ——14 m—— A

x

$$14^2 + y^2 = 19^2$$
$$y^2 = 19^2 - 14^2$$
$$y^2 = 165$$
$$y = \sqrt{165}$$
$$= 12.84523\ldots$$

$$10^2 + "12.84523"^2 = x^2$$
$$265 = x^2$$
$$x = \sqrt{265}$$
$$= 16.3 \ (3sf)$$

.................16.3................m

(Total for question 5 is 4 marks)

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6 Calculate the length of the AB.
Give your answer to 3 significant figures.

B

x 9.5 cm

A y C

7 cm   4 cm

D

$$4^2 + 7^2 = y^2$$
$$65 = y^2$$

$$x^2 + y^2 = 9.5^2$$
$$x^2 + 65 = 9.5^2$$
$$x^2 = 9.5^2 - 65$$
$$x^2 = 25.25$$
$$x = \sqrt{25.25}$$
$$= 5.02 \quad (3sf)$$

.................5.02................cm

(Total for question 5 is 4 marks)

7

A ——— 17 cm ——— B

8 cm

D C

x
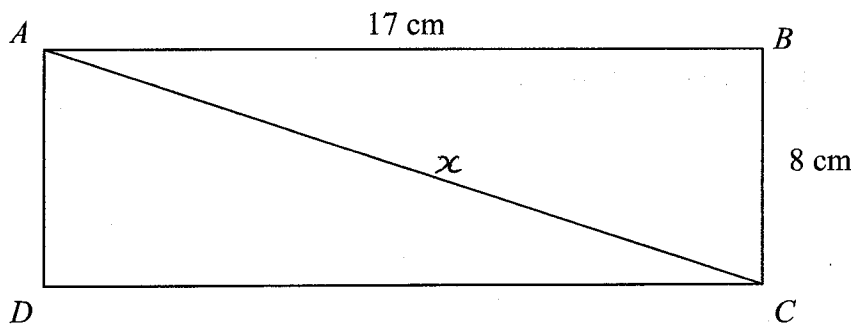
ABCD is a rectangle .
Calculate the length of the diagonal *AC*.

Give your answer correct to 1 decimal place.

$$8^2 + 17^2 = x^2$$
$$353 = x^2$$
$$x = \sqrt{353}$$
$$x = 18.8 \quad (1dp)$$

..............18.8.............cm

(Total for question 7 is 3 marks)

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8   *ABCD* is a trapezium.

Calculate the length of *BC*.

A ——— 15 cm ——— B
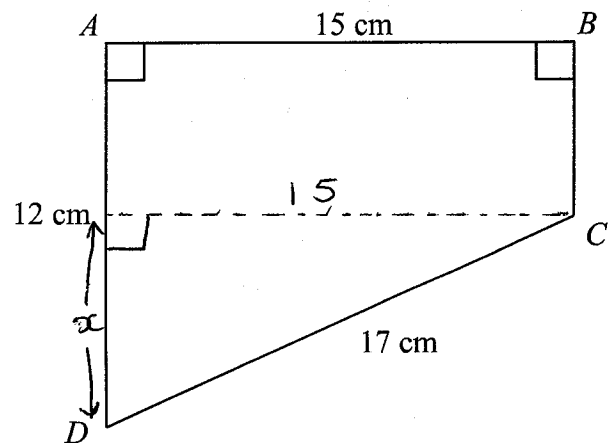
12 cm

15

C

x

D 17 cm

$$x^2 + 15^2 = 17^2$$
$$x^2 = 17^2 - 15^2$$
$$x^2 = 64$$
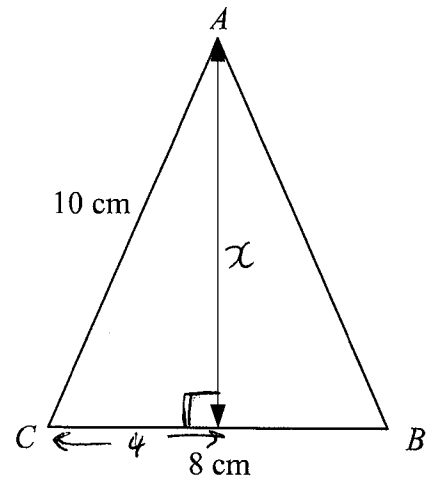$$x = \sqrt{64}$$
$$= 8$$

$$BC = 12 - 8 = 4$$

..............4.............cm

(Total for question 8 is 3 marks)

9   *ABC* is an isosceles triangle.

Calculate the perpendicular height of *ABC*.
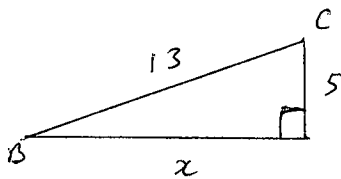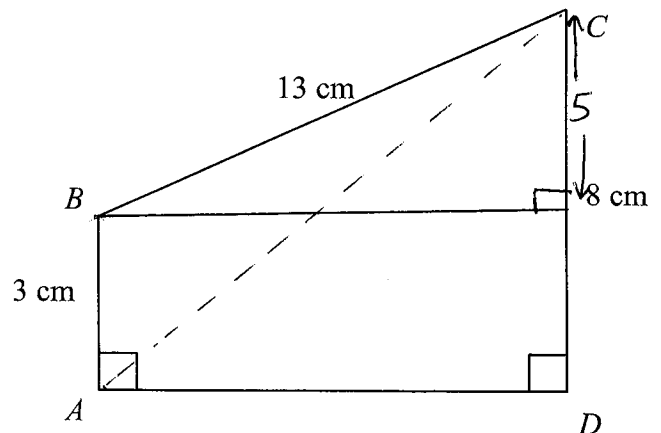Give your answer correct to 3 significant figures..

$$x^2 + 4^2 = 10^2$$
$$x^2 = 10^2 - 4^2$$
$$x^2 = 84$$
$$x = \sqrt{84}$$
$$= 9.17 \quad (3sf)$$
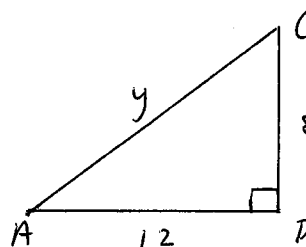
............9.17............cm

(Total for question 9 is 3 marks)

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10   *ABCD* is a trapezium.

Calculate the length of *AC*.
Give your answer correct to 3 significant figures..

$$x^2 + 5^2 = 13^2$$
$$x^2 = 13^2 - 5^2$$
$$x^2 = 144$$
$$x = \sqrt{144}$$
$$= 12$$

$$8^2 + 12^2 = y^2$$
$$y^2 = 208$$
$$y = \sqrt{208}$$
$$y = 14.4$$
$$(3sf)$$

............14.4............cm

(Total for question 10 is 4 marks)

11 A ship leaves point A and sails for 3.7 km due North.
The ship then sails for 2.4 km due East to reach point B.

Calculate the the shortest distance between point A and point B.
Give your answer correct to 1 decimal place.
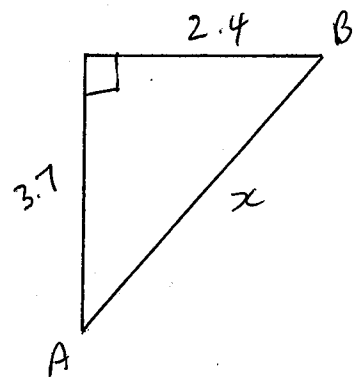
$$2.4^2 + 3.7^2 = x^2$$

$$x^2 = 19.45$$

$$x = \sqrt{19.45}$$

$$= 4.4 \text{ km } (1dp)$$

.................4.4................km

(Total for question 11 is 3 marks)

12 250CM
A ladder reaches 2.5 m up a vertical wall.
The base of the ladder is 70 cm from the base of the wall on a horizontal ground.

Find the length of the ladder.
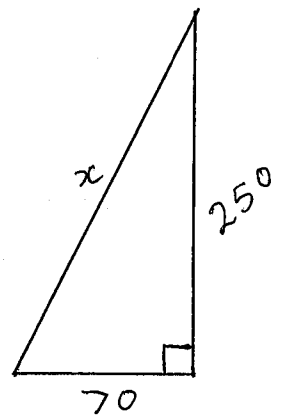
$$70^2 + 250^2 = x^2$$

$$67400 = x^2$$

$$x^2 = 67400$$

$$x = \sqrt{67400}$$

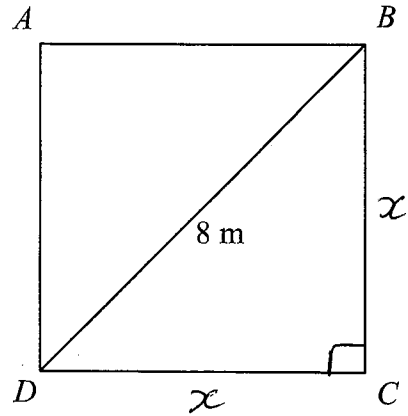$$= 259.6150997 \text{ cm}$$

$$= 260 \text{ cm } (nearest \text{ cm})$$

.................260 cm.................

(Total for question 12 is 4 marks)

ok 2.6m

13 *ABCD* is a square.
The diagonal of the square is 8 m.

Calculate the perimeter of the square.
Give your answer correct to one decimal place.

$$x^2 + x^2 = 8^2$$
$$2x^2 = 64$$
$$x^2 = 32$$
$$x = \sqrt{32}$$
$$= 5.65685424 9 \text{ m}$$

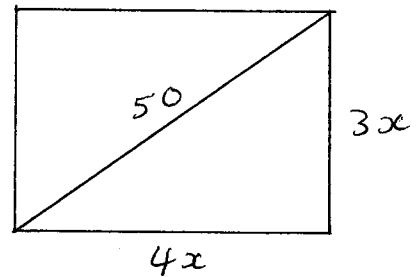$$4 \times 5.656\ldots = 22.6 \text{ m } (1dp)$$

.................22.6.................m

(Total for question 13 is 3 marks)

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14 A television has a diagonal length of 50 inches.

The ratio of the length of the television to the width of the television is 4:3

Calculate the length and the width of the television.
Give your answers correct to 1 decimal place.

$$(3x)^2 + (4x)^2 = 50^2$$
$$9x^2 + 16x^2 = 2500$$
$$25x^2 = 2500$$
$$x^2 = 100$$
$$x = 10$$

$$4 \times 10 = 40$$
$$3 \times 10 = 30$$

Length ....40................. inches

Width ....30................. inches

(Total for question 14 is 3 marks)