

Edexcel GCSE

Mathematics (Linear) – 1MA0

PYTHAGORAS THEOREM

Materials required for examination

Ruler graduated in centimetres and millimetres, protractor, compasses, pen, HB pencil, eraser.
Tracing paper may be used.

Items included with question papers

Nil



Instructions

Use black ink or ball-point pen.

Fill in the boxes at the top of this page with your name, centre number and candidate number.

Answer all questions.

Answer the questions in the spaces provided – there may be more space than you need.

Calculators may be used.

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.

Questions labelled with an asterisk (*) are ones where the quality of your written communication will be assessed – you should take particular care on these questions with your spelling, punctuation and grammar, as well as the clarity of expression.

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.

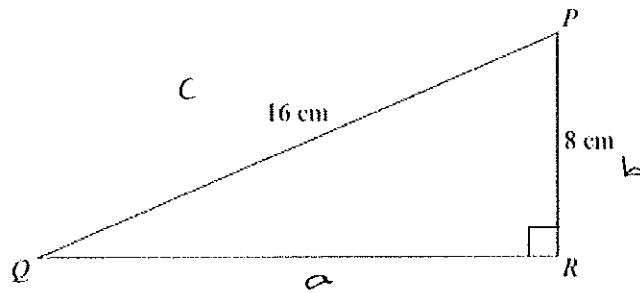


Diagram NOT
accurately drawn

PQR is a right-angled triangle.

$PQ = 16$ cm.

$PR = 8$ cm.

Calculate the length of QR .

Give your answer correct to 2 decimal places.

$$\begin{aligned} a^2 + b^2 &= c^2 \\ a^2 + 8^2 &= 16^2 \\ a^2 &= 16^2 - 8^2 \\ a &= \sqrt{16^2 - 8^2} \\ &= 13.86 \text{ (2dp)} \end{aligned}$$

..... 13.86 cm

(3 marks)

2.

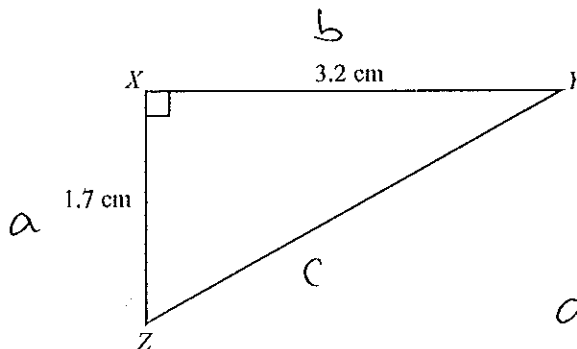


Diagram NOT
accurately drawn

XYZ is a right-angled triangle.

$XY = 3.2$ cm.

$XZ = 1.7$ cm.

Calculate the length of YZ .

Give your answer correct to 3 significant figures.

$$\begin{aligned} a^2 + b^2 &= c^2 \\ 1.7^2 + 3.2^2 &= c^2 \\ \sqrt{1.7^2 + 3.2^2} &= c \\ c &= 3.62 \text{ (3sf)} \end{aligned}$$

..... 3.62 cm

(3 marks)

3.

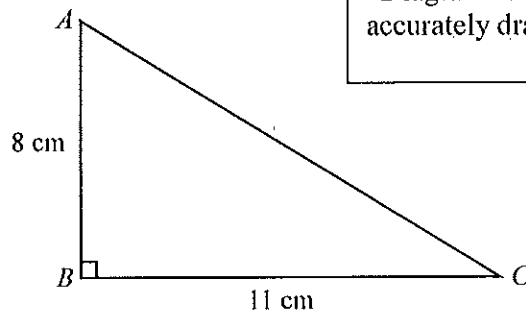


Diagram NOT
accurately drawn

ABC is a right-angled triangle.

$AB = 8$ cm,
 $BC = 11$ cm.

$$c = \sqrt{8^2 + 11^2}$$

Calculate the length of AC .

Give your answer correct to 3 significant figures.

..... 13.6 cm

(3 marks)

4.

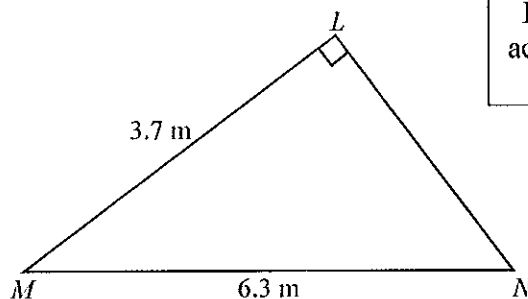


Diagram NOT
accurately drawn

Angle $MLN = 90^\circ$.

$LM = 3.7$ m.

$MN = 6.3$ m.

Work out the length of LN .

Give your answer correct to 3 significant figures.

$$\sqrt{6.3^2 - 3.7^2}$$

$LN =$ 5.10 m

(3 marks)

5.

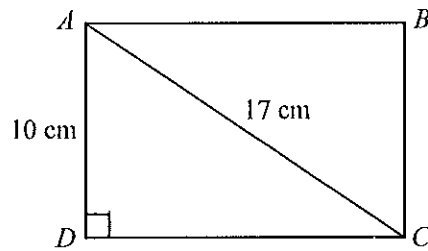


Diagram NOT
accurately drawn

$ABCD$ is a rectangle.

$AC = 17$ cm.

$AD = 10$ cm.

$$\sqrt{17^2 - 10^2}$$

Calculate the length of the side CD .

Give your answer correct to one decimal place.

13.7
..... cm

(3 marks)

6.

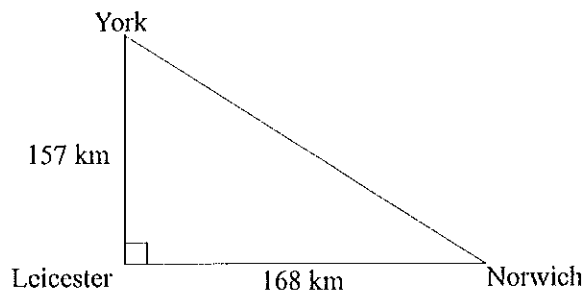


Diagram NOT accurately drawn

The diagram shows three cities.

Norwich is 168 km due East of Leicester.

York is 157 km due North of Leicester.

$$\sqrt{157^2 + 168^2}$$

Calculate the distance between Norwich and York.

Give your answer correct to the nearest kilometre.

230
..... km

(3 marks)

7.

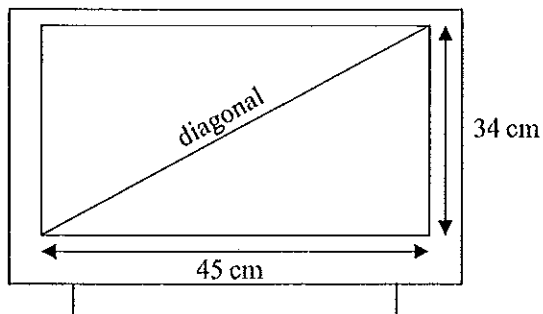


Diagram **NOT**
accurately drawn

A rectangular television screen has a width of 45 cm and a height of 34 cm.

Work out the length of the diagonal of the screen.
Give your answer correct to the nearest centimetre.

$$\sqrt{45^2 + 34^2}$$

.....56..... cm

(4 marks)

8.

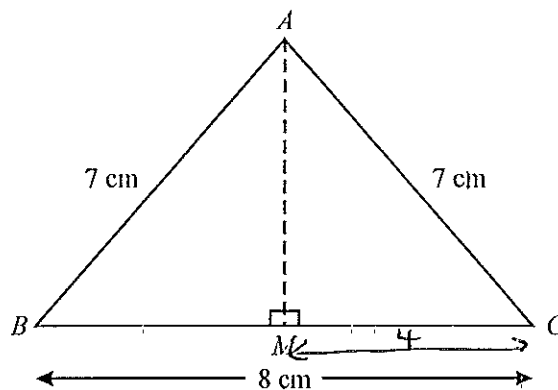


Diagram **NOT** accurately drawn

Work out the length, in centimetres, of AM .
Give your answer correct to 2 decimal places.

$$\sqrt{7^2 - 4^2}$$

.....5.74..... cm

(3 marks)

9.

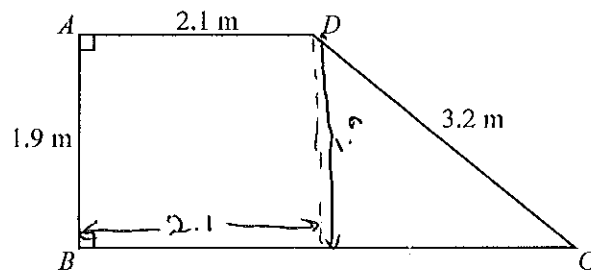


Diagram NOT accurately drawn

$ABCD$ is a trapezium.

AD is parallel to BC .

Angle $A = \text{angle } B = 90^\circ$.

$AD = 2.1 \text{ m}$, $AB = 1.9 \text{ m}$, $CD = 3.2 \text{ m}$.

Work out the length of BC .

Give your answer correct to 3 significant figures.

$$2.1 + \sqrt{3.2^2 - 1.9^2}$$

..... 4.67 m

(4 marks)

10.

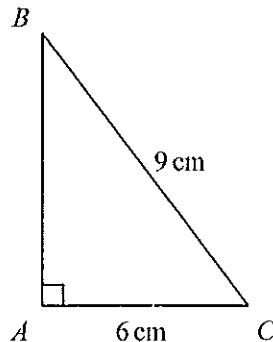


Diagram NOT accurately drawn

ABC is a right-angled triangle.

$AC = 6 \text{ cm}$.

$BC = 9 \text{ cm}$.

Work out the length of AB .

Give your answer correct to 3 significant figures.

$$\sqrt{9^2 - 6^2}$$

6.71 (3sf)

..... 6.71 cm

(3 marks)

11.

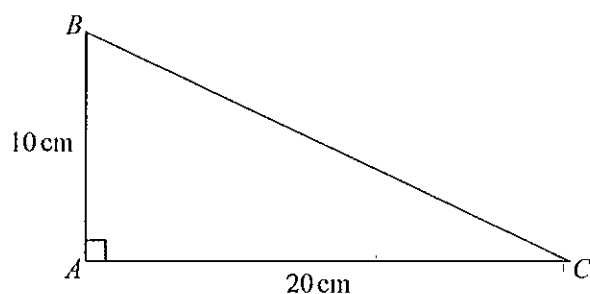


Diagram NOT accurately drawn

In triangle ABC ,

$$AB = 10 \text{ cm}$$

$$AC = 20 \text{ cm}$$

$$\text{angle } BAC = 90^\circ$$

$$\sqrt{10^2 + 20^2}$$

Work out the length of BC .

Give your answer correct to 3 significant figures.

You must state the units in your answer.

$$\dots\dots\dots 22.4 \text{ cm} \dots\dots\dots$$

(4 marks)

12.

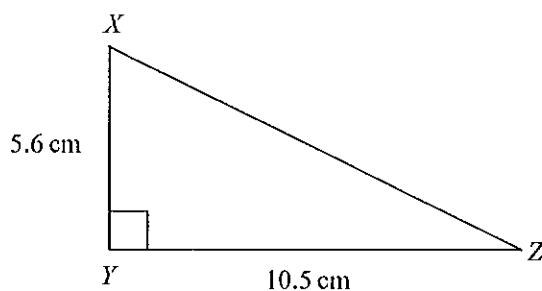


Diagram NOT accurately drawn

In the triangle XYZ

$$XY = 5.6 \text{ cm}$$

$$YZ = 10.5 \text{ cm}$$

$$\text{angle } XYZ = 90$$

Work out the length of XZ .

$$\sqrt{10.5^2 + 5.6^2}$$

$$\dots\dots\dots 11.9 \dots\dots\dots \text{ cm}$$

(3 marks)

13. $ABCD$ is a trapezium.

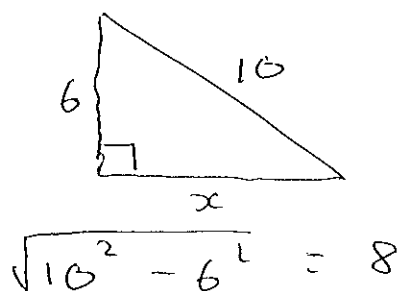
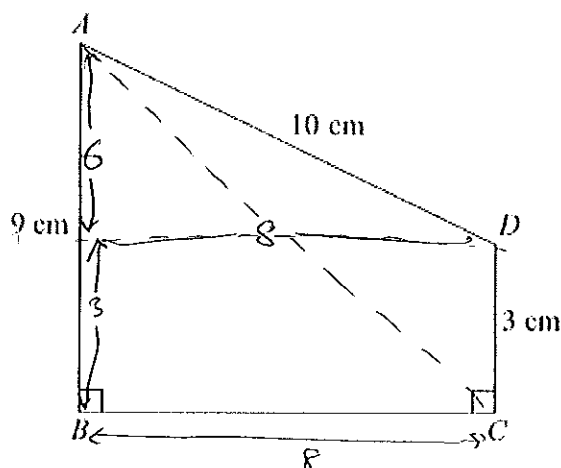


Diagram NOT
accurately drawn



$$AD = 10 \text{ cm}$$

$$AB = 9 \text{ cm}$$

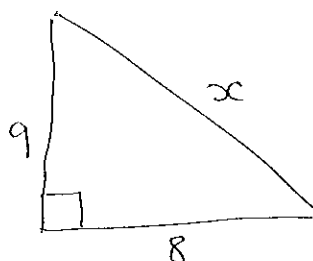
$$DC = 3 \text{ cm}$$

$$\text{Angle } ABC = \text{angle } BCD = 90^\circ$$

Calculate the length of AC .

Give your answer correct to 3 significant figures.

$$\sqrt{8^2 + 9^2}$$



12.0 cm

(5 marks)

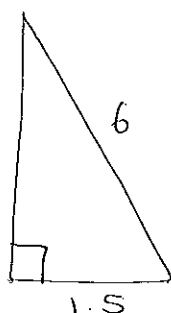
14. A ladder is 6 m long.

The ladder is placed on horizontal ground, resting against a vertical wall.

The instructions for using the ladder say that the bottom of the ladder must **not** be closer than 1.5 m from the bottom of the wall.

How far up the wall can the ladder reach?

Give your answer correct to 1 decimal place.



$$\sqrt{6^2 - 1.5^2}$$

5.8 m m
(4 marks)