

Centre No.						Paper Reference						Surname	Initial(s)	
Candidate No.						1	3	8	0	/	4	H	Signature	

Paper Reference(s)

1380/4H

Edexcel GCSE

Mathematics (Linear) – 1380

Paper 4 (Calculator)

Trigonometry

Past Paper Questions

Arranged by Topic



Examiner's use only

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Team Leader's use only

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ANSWERS

Materials required for examination

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

Items included with question papers

Nil

Instructions to Candidates

In the boxes above, write your centre number, candidate number, your surname, initials and signature.

Check that you have the correct question paper.

Answer ALL the questions. Write your answers in the spaces provided in this question paper.

You must NOT write on the formulae page.

Anything you write on the formulae page will gain NO credit.

If you need more space to complete your answer to any question, use additional answer sheets.

Information for Candidates

The marks for individual questions and the parts of questions are shown in round brackets: e.g. (2).

There are 26 questions in this question paper. The total mark for this paper is 100.

There are 24 pages in this question paper. Any blank pages are indicated.

Calculators may be used.

If your calculator does not have a π button, take the value of π to be 3.142 unless the question instructs otherwise.

Advice to Candidates

Show all stages in any calculations.

Work steadily through the paper. Do not spend too long on one question.

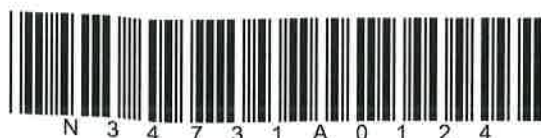
If you cannot answer a question, leave it and attempt the next one.

Return at the end to those you have left out.

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Compiled by Peter Bland



Turn over

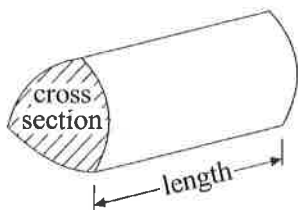
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GCSE Mathematics (Linear) 1380

Formulae: Higher Tier

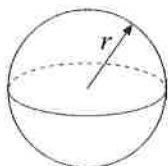
You must not write on this formulae page.
Anything you write on this formulae page will gain NO credit.

Volume of a prism = area of cross section $\times$ length



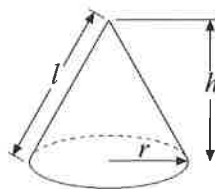
Volume of sphere = $\frac{4}{3} \pi r^3$

Surface area of sphere = $4\pi r^2$

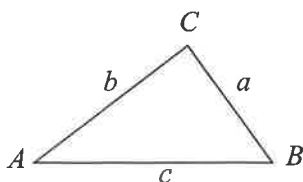


Volume of cone = $\frac{1}{3} \pi r^2 h$

Curved surface area of cone = $\pi r l$



In any triangle ABC



The Quadratic Equation

The solutions of $ax^2 + bx + c = 0$

where $a \neq 0$, are given by

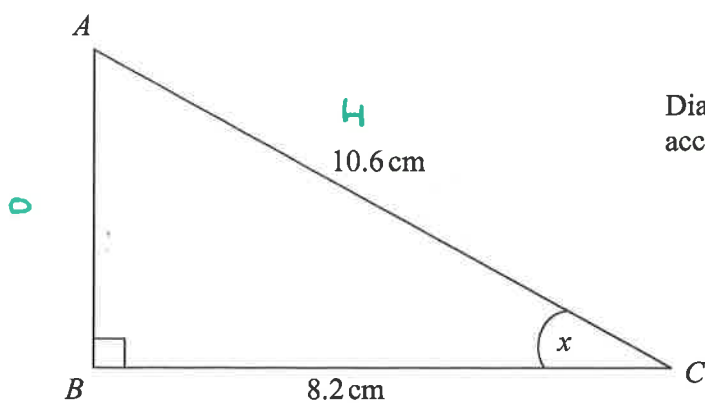
$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

Sine Rule $\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$

Cosine Rule $a^2 = b^2 + c^2 - 2bc \cos A$

Area of triangle = $\frac{1}{2} ab \sin C$

1.

Diagram NOT
accurately drawn ABC is a right-angled triangle. $AC = 10.6$ cm. $BC = 8.2$ cm.Calculate the size of the angle marked x .

Give your answer correct to 3 significant figures.

Soh Cah Toa

$$\cos x = \frac{A}{H}$$

$$\cos x = \frac{8.2}{10.6}$$

$$\cos x = 0.7735$$

$$x = \cos^{-1}(0.7735)$$

$$x = 39.331$$

39.3

(Total 3 marks)

Q1

2. Here is a right-angled triangle.

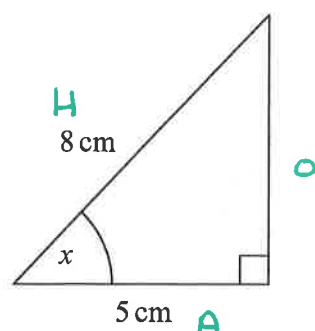


Diagram NOT
accurately drawn

S o h C a n T o a

$$\cos x = \frac{A}{H}$$

$$\cos x = \frac{5}{8}$$

$$\cos x = 0.625$$

$$x = \cos^{-1}(0.625)$$

$$x = 51.3178$$

- (a) Calculate the size of the angle marked x .
Give your answer correct to 1 decimal place.

$$x = \underline{51.3}^{\circ} \quad (3)$$

Here is another right-angled triangle.

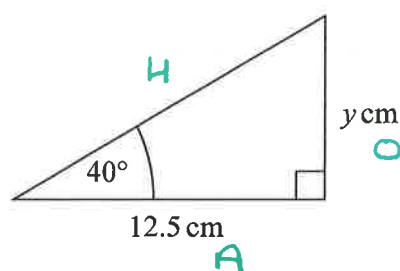


Diagram NOT
accurately drawn

S o h C a n T o a

$$\tan 40^{\circ} = \frac{O}{A}$$

$$\tan 40^{\circ} = \frac{y}{12.5}$$

$$y = \tan 40^{\circ} \times 12.5$$

$$y = 0.839 \times 12.5$$

$$y = 10.4875$$

- (b) Calculate the value of y .
Give your answer correct to 1 decimal place.

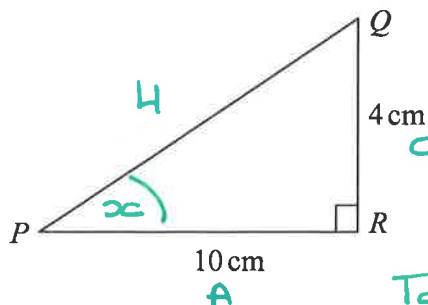
$$y = \underline{10.5 \text{ cm}} \quad (3)$$

(Total 6 marks)

Q2

3.

Diagram NOT
accurately drawn



PQR is a right-angled triangle.

$QR = 4 \text{ cm}$
 $PR = 10 \text{ cm}$

Work out the size of angle RPQ .
Give your answer correct to 3 significant figures.

Soh Cah Toa

$$\tan x = \frac{O}{A}$$

$$\tan x = \frac{4}{10}$$

$$\tan x = 0.4$$

$$x = \tan^{-1}(0.4)$$

$$x = 21.8014$$

21.8

Q3

(Total 3 marks)

4.

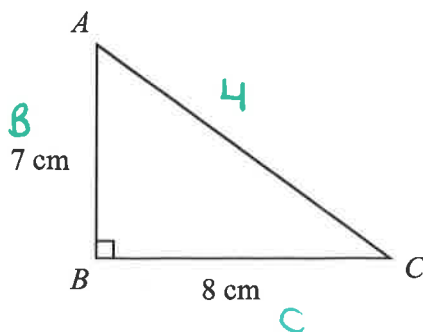


Diagram **NOT**
accurately drawn

ABC is a right-angled triangle.

$AB = 7$ cm,

$BC = 8$ cm.

(a) Work out the area of the triangle.

$$\begin{aligned} \text{area} &= \frac{1}{2} b \times h \\ &= \left(\frac{1}{2} \times 8 \right) \times 7 \\ &= 4 \times 7 \\ &= 28 \end{aligned}$$

..... **28** cm²
(2)

(b) Work out the length of AC .
Give your answer correct to 2 decimal places.

$$\begin{aligned} H^2 &= B^2 + C^2 \\ H^2 &= 7^2 + 8^2 \\ H^2 &= 49 + 64 \\ H^2 &= 113 \\ H &= \sqrt{113} \\ H &= 10.36014 \end{aligned}$$

..... **10.63** cm
(3)

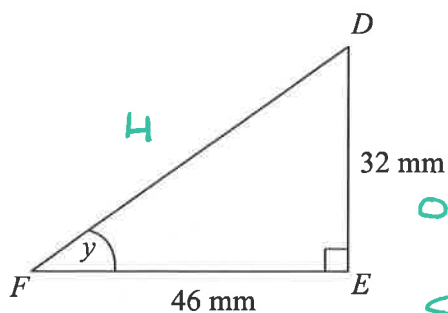


Diagram **NOT**
accurately drawn

DEF is another right-angled triangle.

DE = 32 mm,

FE = 46 mm.

- (c) Calculate the size of angle *y*.
Give your answer correct to 1 decimal place.

O

Son Can Toa

$$\tan y = \frac{O}{A}$$

$$\tan y = \frac{32}{46}$$

$$\tan y = 0.6956$$

$$y = \tan^{-1}(0.695)$$

$$y = 34.7993$$

34.8

°

(3)

Q4

(Total 8 marks)

5.

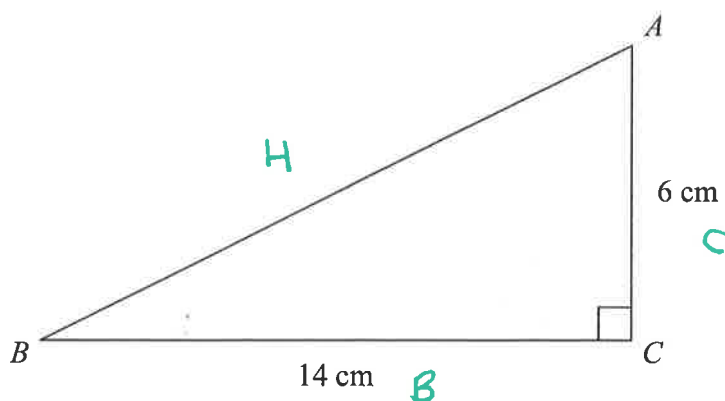


Diagram **NOT**
accurately drawn

ABC is a right-angled triangle.

$AC = 6$ cm.

$BC = 14$ cm.

(a) Work out the area of triangle ABC .

$$\begin{aligned} \text{area} &= \frac{1}{2} b \times h \\ &= \left(\frac{1}{2} \times 14 \right) \times 6 \\ &= 7 \times 6 \\ &= 42 \end{aligned}$$

..... 42 cm²
(2)

(b) Calculate the length of AB .

Give your answer correct to 2 decimal places.

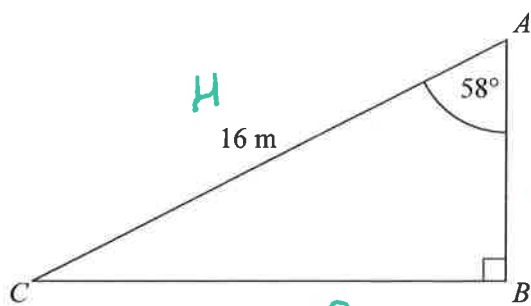
$$\begin{aligned} H^2 &= B^2 + C^2 \\ H^2 &= 14^2 + 6^2 \\ H^2 &= 196 + 36 \\ H^2 &= 232 \\ H &= \sqrt{232} \\ H &= 15.23154 \end{aligned}$$

..... 15.23 cm
(3)

(Total 5 marks)

Q5

6.



ABC is a right-angled triangle.
 $AC = 16$ m.
 Angle $CAB = 58^\circ$

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

Diagram NOT
accurately drawn

? $\sin \cos \tan$
 $\cos 58^\circ = \frac{AB}{16}$
 $\cos 58 = \frac{x}{16}$
 $x = \cos 58 \times 16$
 $x = 0.529 \times 16$
 $x = 8.4787$

8.48 m
 (Total 3 marks)

Q6

7.

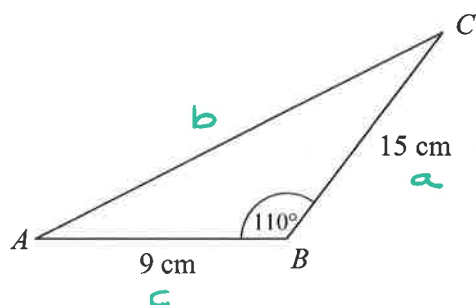


Diagram NOT accurately drawn

ABC is a triangle.
 $AB = 9 \text{ cm}$
 $BC = 15 \text{ cm}$
 $\text{Angle } ABC = 110^\circ$

Calculate the area of the triangle.
 Give your answer correct to 3 significant figures.

$$\begin{aligned} \text{area} &= \left(\frac{1}{2} \times 19.95845 \right) \times \sin 110^\circ \\ \text{area} &= 9.979 \times \sin 110 \\ \text{area} &= 9.979 \times 0.9396 \\ \text{area} &= 9.37719 \end{aligned}$$

$$\text{area} = \frac{1}{2} ac \sin B$$

$$\begin{aligned} b^2 &= a^2 + c^2 - 2ac \cos B^\circ \\ b^2 &= 15^2 + 9^2 - 2 \times 15 \times 9 \cos 110^\circ \end{aligned}$$

$$b^2 = 225 + 81 - (2 \times 15 \times 9 \times -0.342)$$

$$b^2 = 306 - (-92.342)$$

$$b^2 = 306 - (-92.34)$$

$$b^2 = 398.34$$

$$b = \sqrt{398.34}$$

$$b = 19.95845 = AC$$

$$\dots\dots\dots 9.38 \dots\dots\dots \text{cm}^2$$

(Total 3 marks)

Q7

8. Town B is 4.5 km due West of town C.
Town A is 2.4 km due North of town B.

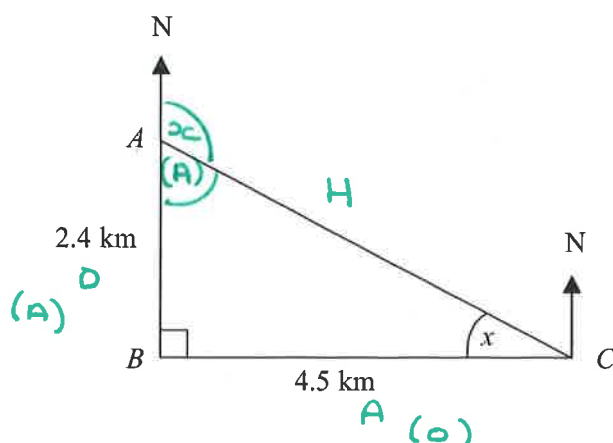


Diagram NOT accurately drawn

- (a) Calculate the size of the angle marked x .
Give your answer correct to 3 significant figures.

Son Can Toa

$$\tan x = \frac{O}{A}$$

$$\tan x = \frac{2.4}{4.5}$$

$$\tan x = 10.8$$

$$x = \tan^{-1}(10.8)$$

$$x = 84.70991$$

$$x = 84.7^\circ$$

(3)

- (b) Find the bearing of town C from town A.
Give your answer correct to 3 significant figures.

Son Can Toa

$$\tan A = \frac{4.5}{2.4}$$

$$\tan A = 1.875$$

$$A = \tan^{-1}(1.875)$$

$$A = 61.92751$$

$$x = 180 - 61.92$$

$$x = 118.07248$$

$$118^\circ$$

(1)

(Total 4 marks)

Q8

9.

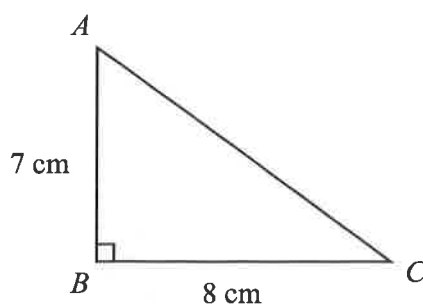


Diagram **NOT**
accurately drawn

ABC is a right-angled triangle.

$AB = 7$ cm,

$BC = 8$ cm.

(a) Work out the area of the triangle.

Same as 4

..... cm^2
(2)

(b) Work out the length of AC .

Give your answer correct to 2 decimal places.

..... cm
(3)

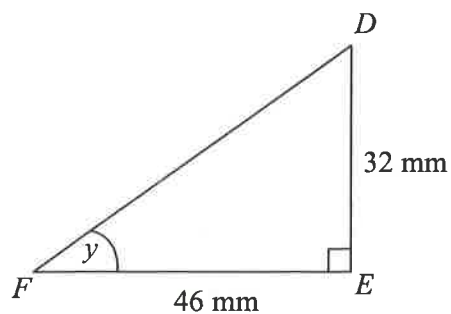


Diagram **NOT**
accurately drawn

DEF is another right-angled triangle.

$DE = 32$ mm,

$FE = 46$ mm.

- (c) Calculate the size of angle y .
Give your answer correct to 1 decimal place.

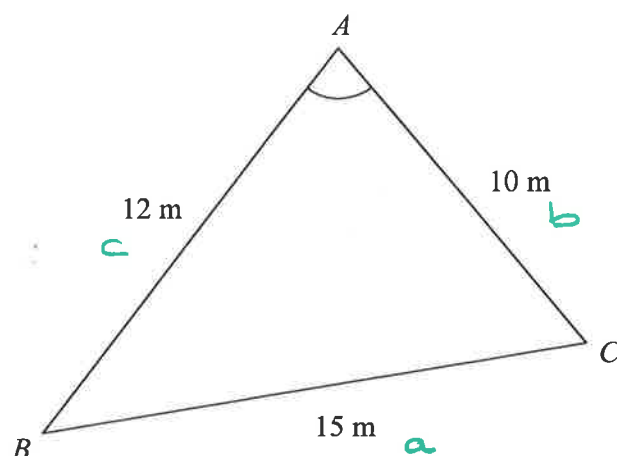
Same as 4

.....
(3)

(Total 8 marks)

Q9

10.

Diagram **NOT**
accurately drawn ABC is a triangle. $AB = 12\text{ m.}$ $AC = 10\text{ m.}$ $BC = 15\text{ m.}$ Calculate the size of angle BAC .

Give your answer correct to one decimal place.

Cosine

$$a^2 = b^2 + c^2 - 2bc \cos A$$

$$15^2 = 10^2 + 12^2 - (2 \times 10 \times 12 \times \cos A)$$

$$225 = 100 + 144 - (240 \times \cos A)$$

$$(240 \times \cos A) + 225 = 100 + 144$$

$$(240 \times \cos A) = 100 + 144 - 225$$

$$240 \times \cos A = 19$$

$$\cos A = \frac{19}{240}$$

$$\cos A = 0.07916$$

$$A = \cos^{-1}(0.07916)$$

$$A = 85.45971$$

85.5

(Total 3 marks)

Q10

11.

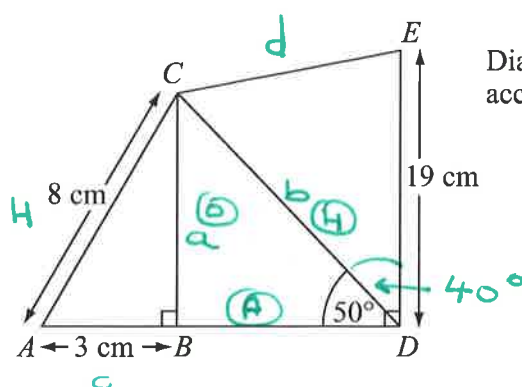


Diagram NOT
accurately drawn

$$AC = 8 \text{ cm.}$$

$$AB = 3 \text{ cm.}$$

$$DE = 19 \text{ cm.}$$

$$\text{Angle } ABC = \text{angle } CBD = \text{angle } BDE = 90^\circ.$$

$$\text{Angle } BDC = 50^\circ.$$

(a) Calculate the length of CD .

Give your answer correct to 3 significant figures.

$$H^2 = c^2 + a^2$$

$$8^2 = 3^2 + a^2$$

$$64 = 9 + a^2$$

$$a^2 = 64 - 9$$

$$a^2 = 55$$

$$a = \sqrt{55}$$

$$a = 7.416198$$

$$\sin 50 = \frac{a}{H}$$

$$\sin 50 = \frac{a}{H}$$

$$\sin 50 = \frac{7.416}{H}$$

$$\sin 50 \times H = 7.416$$

$$H = \frac{7.416}{\sin 50} = \frac{7.416}{0.76604}$$

$$H = 9.6809 \quad 9.68 \text{ cm}$$

(4)

(b) Calculate the length of CE .

Give your answer correct to 3 significant figures.

$$90 - 50 = 40^\circ$$

$$d^2 = e^2 + c^2 - 2ec \cos D$$

$$d^2 = 9.68^2 + 19^2 - 2 \times 9.68 \times 19 \times \cos 40$$

$$d^2 = 93.7024 + 361 - (367.84 \times \cos 40)$$

$$d^2 = 454.7024 - (367.84 \times 0.76604)$$

$$d^2 = 454.7027 - 281.781788$$

$$d^2 = 172.920912$$

$$d = \sqrt{172.92}$$

13.1..... cm

(3)

(Total 7 marks)

$$d = 13.149$$

Q11

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