Higher Maths Summer 2019 P2 Q6

PQR is a right-angled triangle.
PR = 16·7 cm, QR = 9·6 cm.

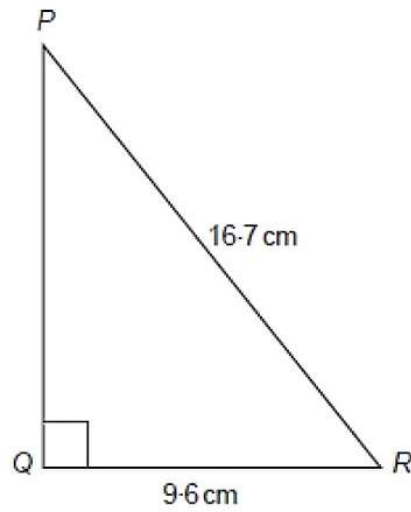*Diagram not drawn to scale*

Calculate the size of $Q\hat{P}R$.   [3]

_____

Higher Maths Nov 2017 P2 Q7

The diagram shows two right-angled triangles, joined together along a common side.

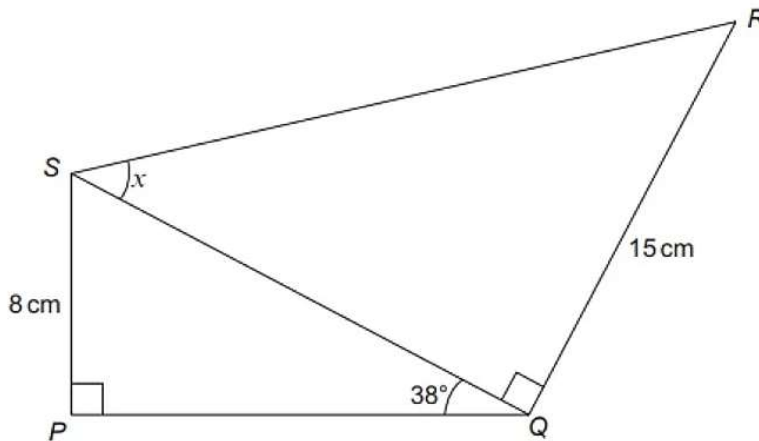$S\hat{P}Q = 90°$, $S\hat{Q}R = 90°$, $S\hat{Q}P = 38°$, PS = 8 cm and QR = 15 cm.

Diagram not drawn to scale

Calculate the size of angle x.   [6]

_____

Higher Maths June 2017 P2 Q6

Calculate the length of the side *QR* in the triangle *PQR* shown below.   [3]
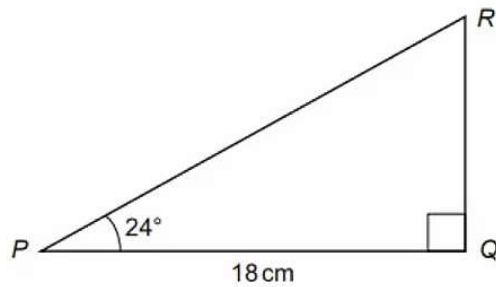

Diagram not drawn to scale

_____

Higher Numeracy Summer 2018 P2 Q3a(ii)

Yared is going to make a door wedge.

(a)   The cross-section of the wedge is shown below.
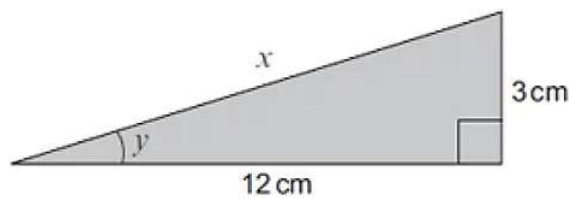   The horizontal length is 12 cm and the vertical height is 3 cm.

Diagram not drawn to scale

(ii)   The wedge must fit under Yared's door.
        The angle *y* must be less than 15°.
        Show that this wedge will fit under Yared's door.
        You must show all your working.   [3]

_____

Higher Numeracy Nov 2016 P2 Q4b

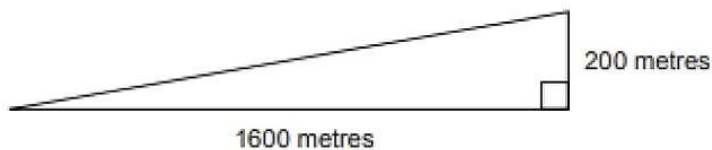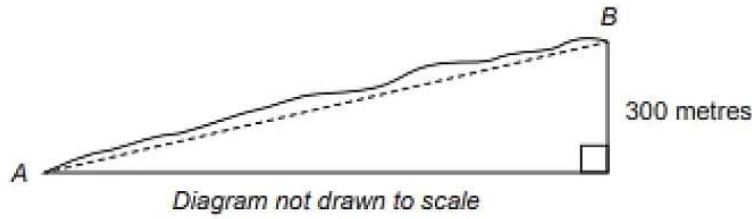(b)   The diagram shows the cross-section of one part of her run.

Diagram not drawn to scale

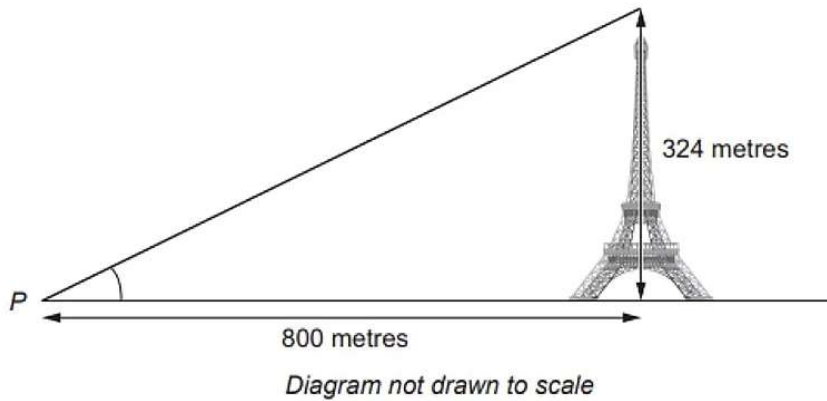Calculate the angle of elevation of the road.   [3]

(c)

Diagram not drawn to scale

Gwenda runs on another section of uneven road from *A* to *B*.
The rise in this section of the road is 300 metres.
The angle of elevation of *B* from *A* is 10°.

(i)   Calculate an estimate of how far Gwenda has run.
      State any assumption you have made.   [4]

(ii) What is the impact of your assumption on your answer?   [1]

___

Higher Numeracy Nov 2018 P2 Q6b

(b)

324 metres

P

800 metres

Diagram not drawn to scale

Calculate the angle of elevation of the top of the Eiffel Tower from the point *P*.   [3]

___

Higher Numeracy Summer 2017 P2 Q4

Ursula is lying on her surfboard 180 metres away from the foot of a vertical cliff.
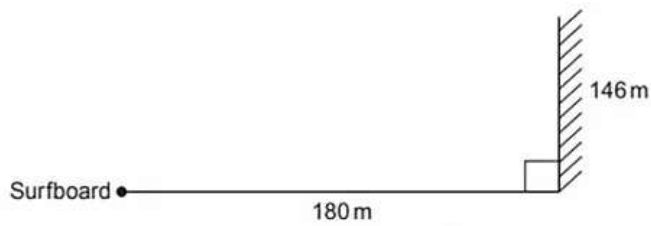The height of the cliff is 146 metres.

146 m

Surfboard ●

180 m

Diagram not drawn to scale

Ursula was told that if the angle of elevation of the top of the cliff from her lying position is between 42° and 45°, it is safe for her to attempt to stand on her surfboard.

Calculate the angle of elevation of the top of the cliff from Ursula's position lying on her surfboard.

State whether it is
- safe for Ursula to attempt to stand, or
- not safe as she is too near the cliff, or
- not safe as she is too far out at sea.   [4]

_____

Higher Numeracy Sample 2 P2 Q6

Luis has a large dog which lives in a kennel.
In order to design a similar kennel for a smaller dog, Luis wants to calculate the angle of elevation of the roof of his dog's kennel.
He has noticed that the front of his dog's kennel is symmetrical.

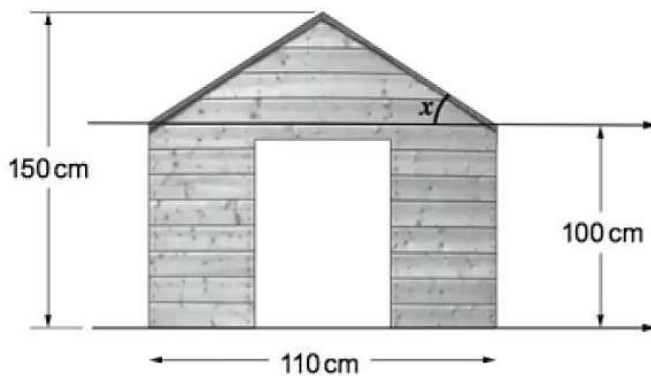He has measured a number of lengths and recorded them on a diagram of the kennel, as shown below.

150 cm

x

100 cm

110 cm

Diagram not drawn to scale

Luis has marked the angle of elevation with an x on the diagram.

(a)   Calculate the size of angle x to an appropriate degree of accuracy.   [5]

(b)   Explain why, in practice, this angle may not be as accurate as you have calculated.   [1]

_____

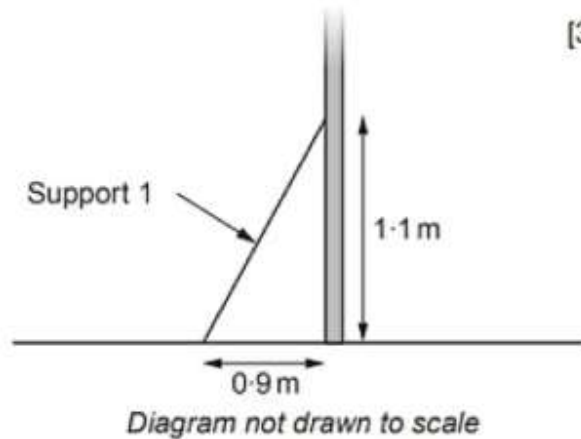Mr Jakob notices a crack in a vertical wall which stands on horizontal ground.

(a)   Mr Jakob fixes two temporary supports against the wall, as shown in the diagram below.

Wall

0·8 m

Support 2

Support 1

1·1 m

0·9 m

Diagram not drawn to scale
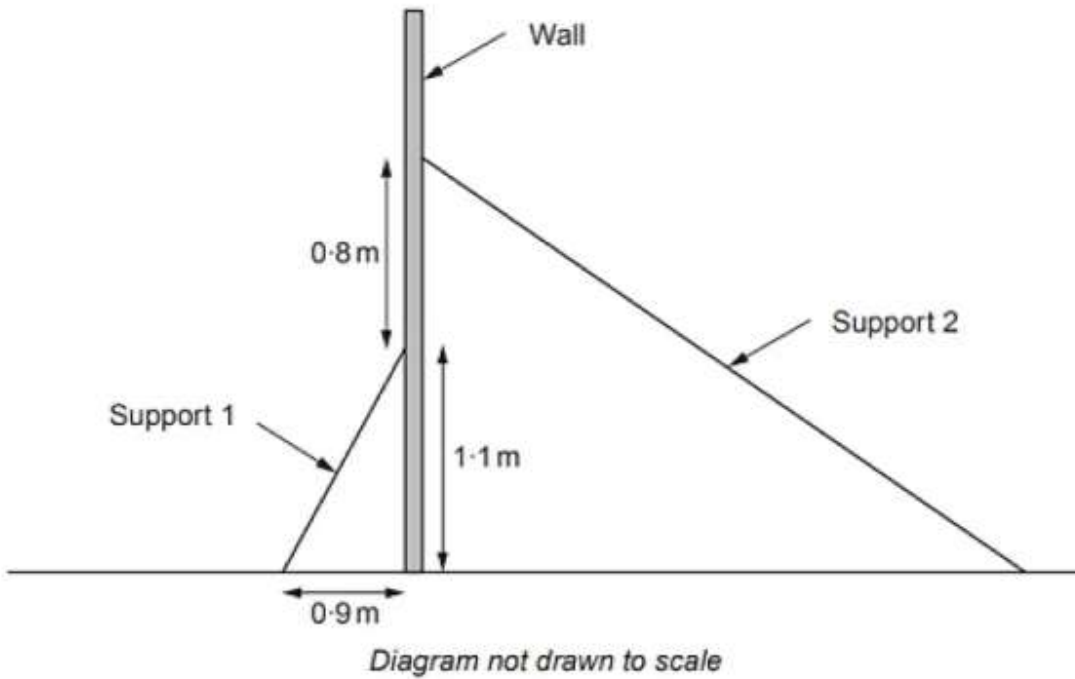
(i)   Calculate the length of Support 1.   [3]

Support 1

1·1 m

0·9 m

Diagram not drawn to scale

(ii)   The length of Support 2 is 2·6 m.
        Calculate the angle between the horizontal ground and Support 2.   [3]

Higher Numeracy Sam 1 P2 Q5

The diagram shows the route a dolphin swam from Port Quay to Rig Bay and then to Jay Cliff.
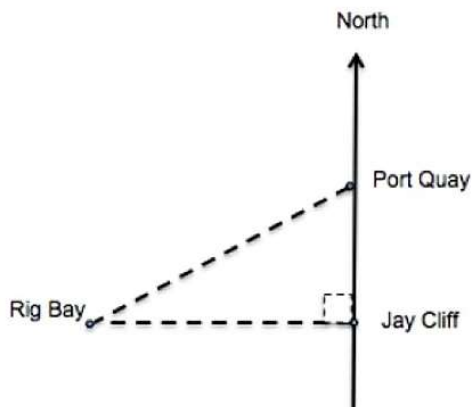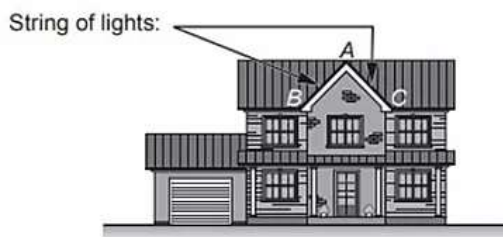
North

Port Quay

Rig Bay

Jay Cliff

Diagram not drawn to scale

Rig Bay is on a bearing of 232° from Port Quay.
The distance from Port Quay to Rig Bay is 3·2 km.
Calculate how far the dolphin swam altogether   [5]

_____

Higher Numeracy Summer 2017 P2 Q8

The diagram below shows where Levi wants to attach a string of lights to his house.

String of lights:

A

B   C

Levi wants to attach a single string of lights from *B* to *A* and then from *A* to *C*.
The diagram below shows the measurements Levi has taken.

A

52°

B   C
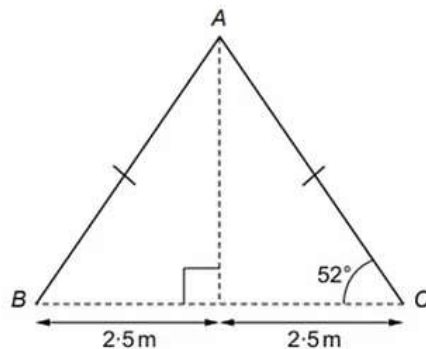   2·5 m   2·5 m

Diagram not drawn to scale

He spends £410 at the electrical store buying a string of lights.
After putting up the lights, Levi finds he has 6 metres of the string of lights left over at one end.

How much did the electrical store charge Levi, per metre, for the string of lights?   [6]
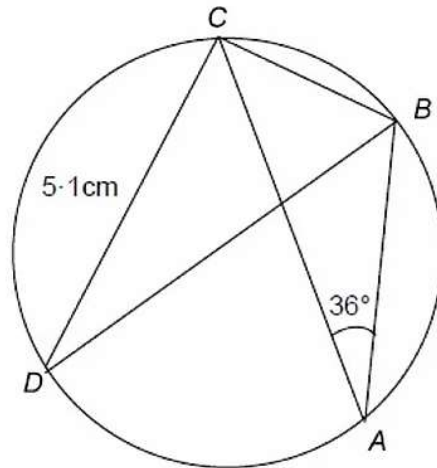
Higher Maths Sample 2 P2_Q8

Diagram not drawn to scale

Points *A*, *B*, *C* and *D* lie on the circumference of a circle. *BD* is the diameter of the circle, *CD* = 5·1 cm and *BÂC* = 36°.

Calculate the length of the chord *BC*.
You must give reasons as part of your solution.

[5]

_____

Higher Maths Nov 2018 P2 Q9

The diagram below shows two right-angled triangles *ABC* and *APQ*.
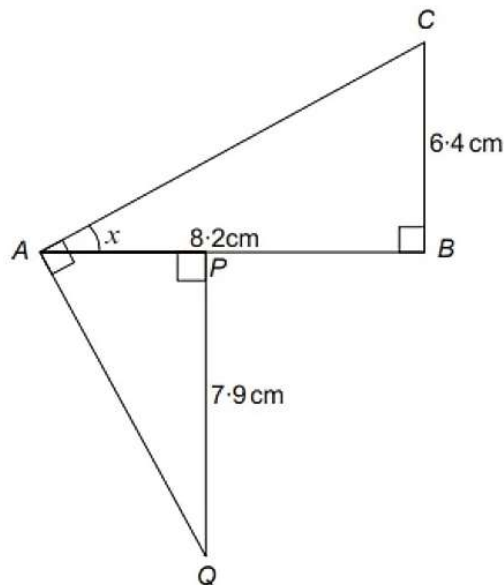*AB* = 8·2 cm, *BC* = 6·4 cm and *PQ* = 7·9 cm.

CÂQ = 90°.

Diagram not drawn to scale

(a)   Calculate the size of angle *x*.   [3]

(b)   Calculate the length *AQ*.   [4]

16 cm

56°

23 cm

15 cm

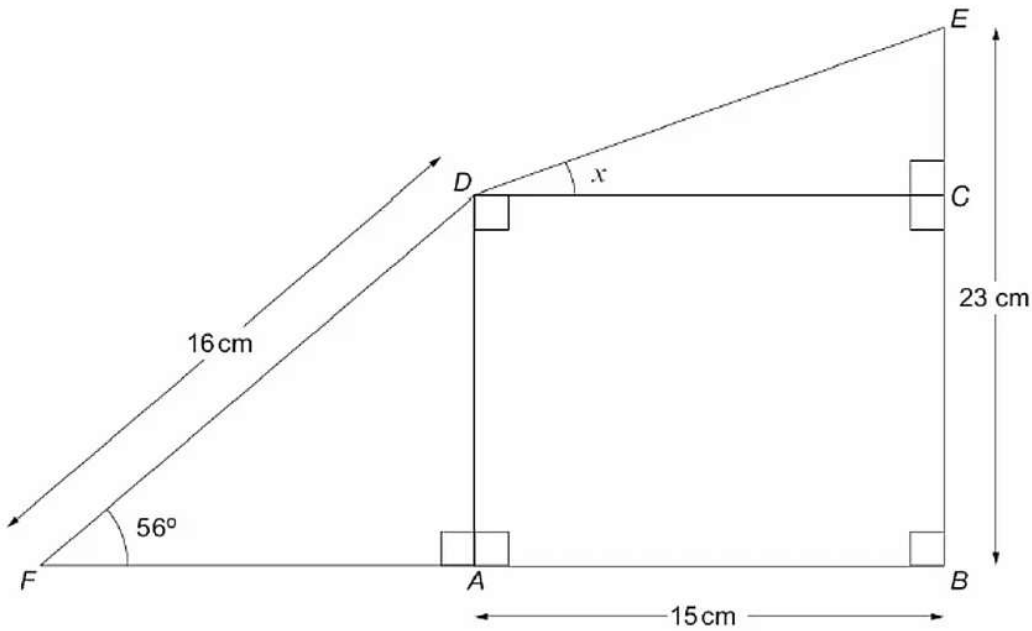*Diagram not drawn to scale*

(a)   Calculate the length *AD*.   [3]

(b)   You will be assessed on the quality of your organisation, communication and accuracy in writing in this part of the question

Find the size of the angle *x*.   [5]

_____

Higher Maths Summer 2018 P2 Q9

ABC and CDE are two right-angled triangles.

In triangle *ABC*, *AB* = 6·5 cm and *BC* = 10·4 cm.
In triangle *CDE*, *CE* = 9·4 cm.

$B\hat{C}E = 22°$.
$A\hat{C}B = x°$.

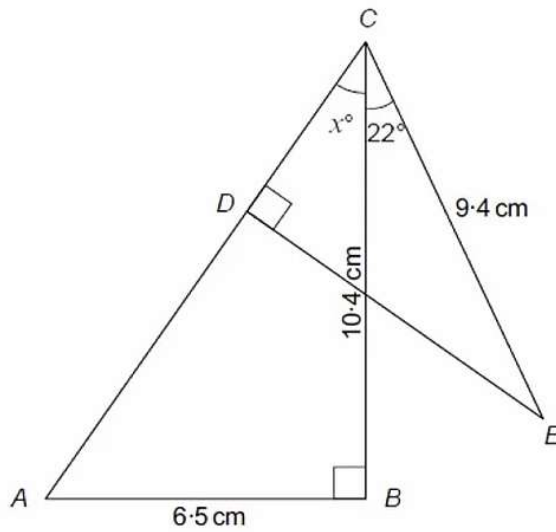*Diagram not drawn to scale*

(a)   Calculate the value of x.   [3]

(b)   Hence find the length of *DE*.   [3]

_____

Higher Maths June 2017 P2 Q11

In this question, you will be assessed on the quality of your organisation, communication and accuracy in writing.

The area of triangle *ABD*, shown in the diagram below, is 35 cm².
AD = 5 cm and *BC* = 32 cm.
D is on the line *AC*, and *BD* is perpendicular to *AC*.

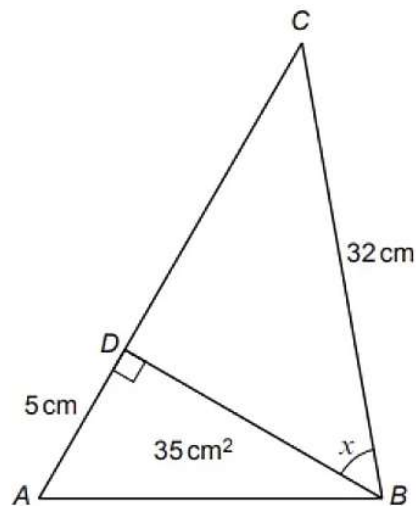*Diagram not drawn to scale*

Calculate the size of angle x.
You must show all your working.   [5 + 2 OCW]

_____

Higher Numeracy Nov 2018 P2_Q8b

(b)   Heledd has been given the following instructions for her voyage:

- From port A, sail 200 km due south to port B.
- From port B, sail due east to port C.
- From port C, sail on a bearing of 318° back to port A.

Use the space below to draw a sketch of the ship's voyage.

N
↑

A •

Calculate the distance from port C directly back to port A.   [4]

_____

Higher Maths Sample 1 P2 Q15ab

Circle the correct answer for each of the following questions.

(a)   tan 30° is equal to,

$\dfrac{-1}{\sqrt{3}}$ $\dfrac{1}{\sqrt{3}}$ $\dfrac{2}{\sqrt{3}}$ $\dfrac{\sqrt{3}}{2}$ $\sqrt{3}$

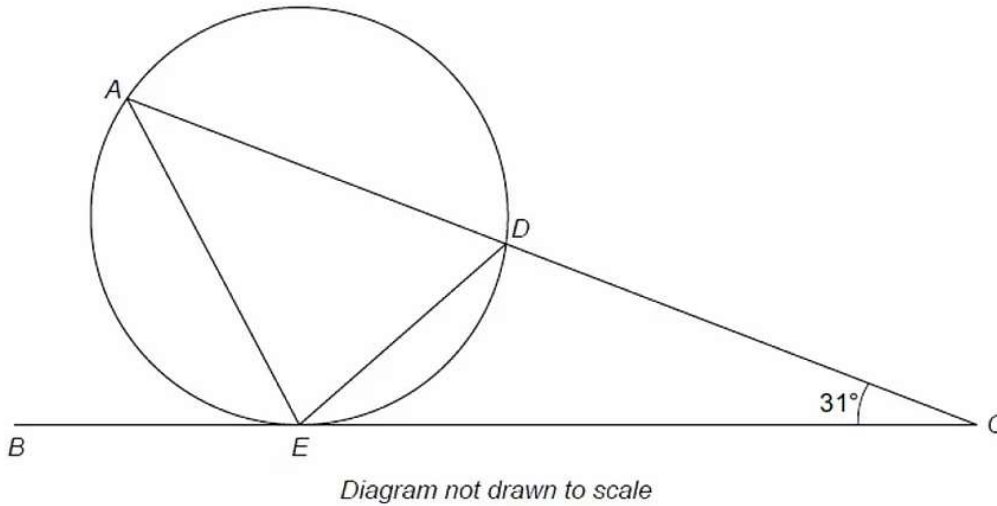   [1]

(b)   cos 150° is equal to,

$\dfrac{1}{2}$ $\dfrac{\sqrt{3}}{2}$ $-\dfrac{1}{2}$ $-\dfrac{\sqrt{3}}{2}$ $\dfrac{1}{\sqrt{3}}$

                                                                                                           [1]

_____

Higher Maths Summer 2018 P2 Q19

BC is the tangent to the circle at point *E*, as shown below.

EC = 8 cm, *AC* = 11 cm and $D\hat{C}E$ = 31°.

Diagram not drawn to scale

(a) Calculate the length of *AE*.   [3]

(b) Calculate the size of $C\hat{E}D$.   [4]

_____