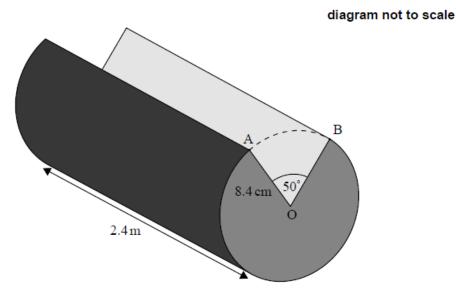
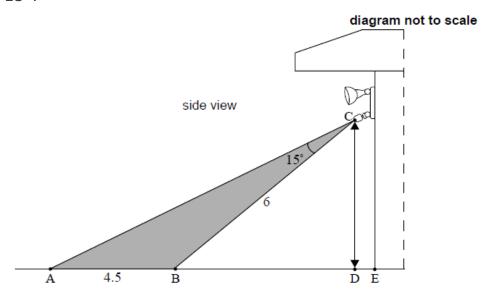
## Mock exam review - geometry and trigonometry [48 marks]

1. Helen is building a cabin using cylindrical logs of length 2.4 m and radius [4 marks] 8.4 cm. A wedge is cut from one log and the cross-section of this log is illustrated in the following diagram.



Find the volume of this log.

Ollie has installed security lights on the side of his house that are activated by a sensor. The sensor is located at point C directly above point D. The area covered by the sensor is shown by the shaded region enclosed by triangle ABC. The distance from A to B is 4.5 m and the distance from B to C is 6 m. Angle  $A\hat{C}B$  is  $15^{\circ}$ .



| 2a. Find CÂB. | [3 marks] |
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A farmer owns a triangular field ABC. The length of side [AB] is  $85\ m$  and side [AC] is  $110\ m.$  The angle between these two sides is  $55\ ^\circ.$ 

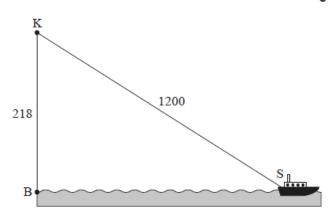
| . Find the area of the field. | [3 marks |
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Kacheena stands at point K, the top of a  $218\ m$  vertical cliff. The base of the cliff is located at point B. A ship is located at point  $S,\,1200\ m$  from Kacheena.

This information is shown in the following diagram.

diagram not to scale

[2 marks]



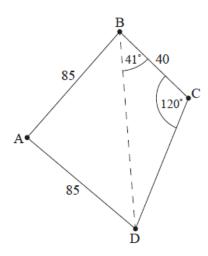
| a. Find the angle of elevation from the ship to Kacheena. | [2 IIIaIKS] |
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| nd the horizontal distance from the base of the cliff to the ship.  | [2 m |
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| rite down your answer to part (b) in the form $a	imes 10^k$ where $\leq a < 10$ and $k \in \mathbb{Z}$ .  | [2 m |
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The following diagram shows a park bounded by a fence in the shape of a quadrilateral  $ABCD. \ \ A$  straight path crosses through the park from B to D.

$$\mathrm{AB} = 85\;\mathrm{m},\;\mathrm{AD} = 85\;\mathrm{m},\;\mathrm{BC} = 40\;\mathrm{m},\;\mathrm{C\widehat{B}D} = 41\,^{\circ},\;\mathrm{B\widehat{C}D} = 120\,^{\circ}$$

diagram not to scale



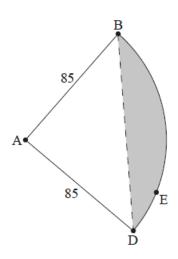
| ā. | Write down the value of angle $\mathrm{BDC}.$ | [1 mark |
|----|---|---------|
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| He | nce use triangle | ${ m BDC}$ to find the length of path ${ m BD}$ . | [3 marks |
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| $\widehat{ m A}{ m D}=77{ m ^\circ}$ for the rest of this question.   |              |
|---|--------------|
| $\widehat{ m A}{ m D}=77^\circ$ for the rest of this question.  | Use<br>[3 ma |
| $\widehat{ m A}{ m D}=77{ m ^\circ}$ for the rest of this question.   |              |
| $\widehat{ m A}{ m D}=77^\circ$ for the rest of this question.  |              |
| $\widehat{ m A}{ m D}=77^\circ$ for the rest of this question.  |              |
| he size of angle $B\widehat{A}D$ rounds to $77^\circ$ , correct to the nearest degree. $\widehat{A}D=77^\circ$ for the rest of this question. nd the area bounded by the path $BD$ , and fences $AB$ and $AD$ . |              |
| $\widehat{ m A}{ m D}=77^\circ$ for the rest of this question.  |              |

A landscaping firm proposes a new design for the park. Fences BC and CD are to be replaced by a fence in the shape of a circular arc BED with center A. This is illustrated in the following diagram.

## diagram not to scale

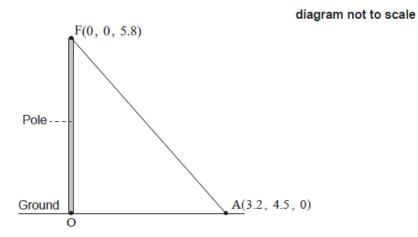


5e. Write down the distance from A to E.

|        |             |               |             |       | <br>    |
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|        |             |               |             |       | <br>    |
| Find t | he perimete | er of the pro | posed park, | ABED. | [3 mari |
|        |             |               |             |       | <br>    |
|        |             |               |             |       |         |

[1 mark]

A vertical pole stands on horizontal ground. The bottom of the pole is taken as the origin, O, of a coordinate system in which the top, F, of the pole has coordinates  $(0,\ 0,\ 5.\ 8)$ . All units are in metres.



The pole is held in place by ropes attached at F.

One of the ropes is attached to the ground at a point A with coordinates  $(3,\,2,\,4,\,5,\,0).$  The rope forms a straight line from A to F.

| 6a. Find the length of the | Find the length of the rope connecting A to F. |  |
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| Find FAO, the angle the rope makes with the ground. | [2 marks] |  |
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