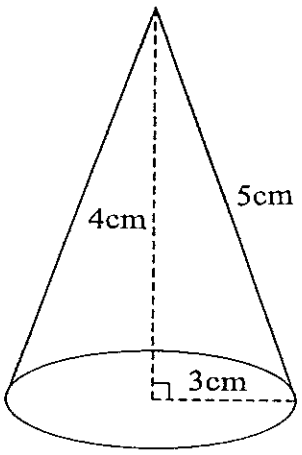
ADVANCED – MEASUREMENT & TRIGONOMETRY

PART A

1.



The volume of this solid is :

A) $12\pi \text{ cm}^3$

B) $4\pi \text{ cm}^3$

C) $15\pi \text{ cm}^3$

D) $20\pi \text{ cm}^3$

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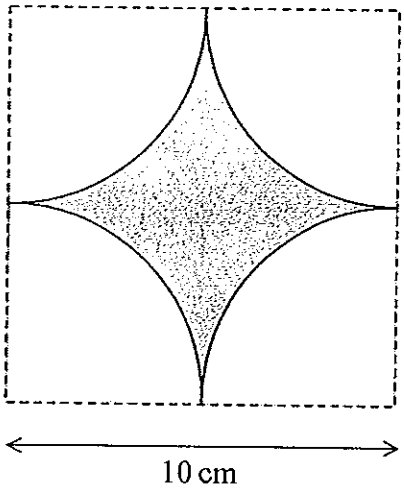
2. The shaded region is formed by removing 4 identical quarter-circles from a square of side 10cm.

The perimeter of the shaded region is:



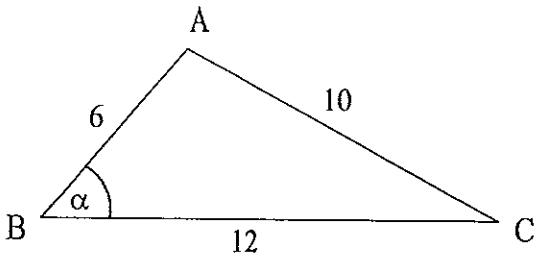
A) 5π cm

B) 10π cm

C) 20π cm

D) 40π cm

3.



Which of the following is correct?

A) $\cos\alpha = \frac{5}{9}$ B) $\cos\alpha = \frac{1}{2}$

C) $\sin\alpha = \frac{5}{6}$ C) $\sin\alpha = \frac{1}{2}$

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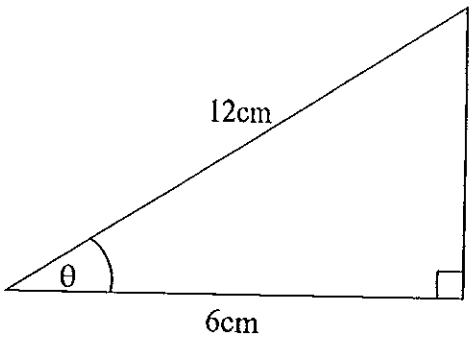
4. Sam is a teacher. He is to write 80 yearly reports for his students. On average, it takes him 5 minutes to write each report and he wants to have a 10 minutes break after each 20 reports completed.

If he starts at 4p.m, at what time of the day does he finish?

A) 10:40p.m B) 10:50p.m C) 11:10p.m D) 11:20p.m

PART B

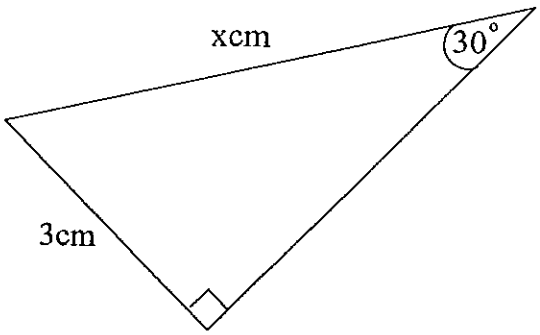
5.



NOT TO SCALE

From the diagram, find the value of θ.

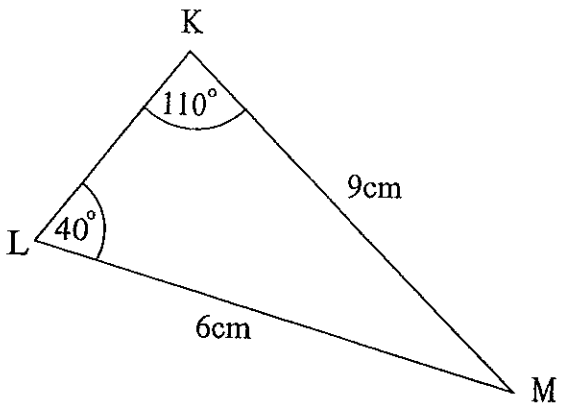
6.



NOT TO SCALE

From the diagram, find the value of x.

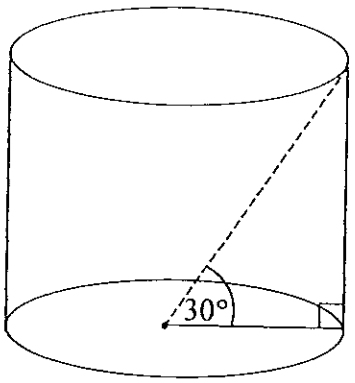
7.



NOT TO SCALE

Find the area of triangle KLM.

8.



From the diagram, find the volume of the cylinder correct to the nearest cubic centimetre.

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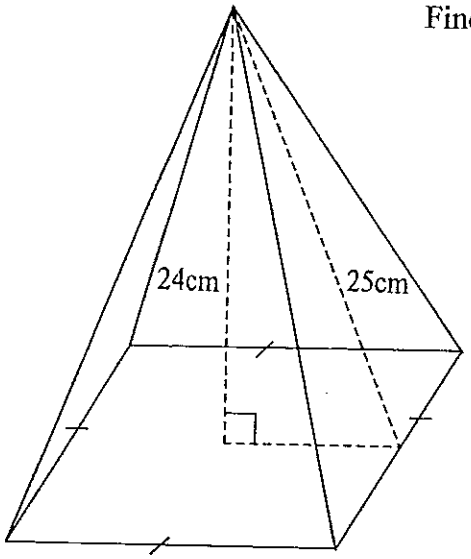
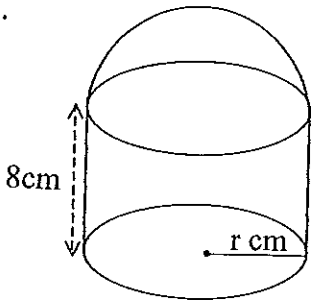
9. Solve the equation $\cos \alpha = \sin 20°$ where α is acute.

10.



Find the surface area of the square pyramid.

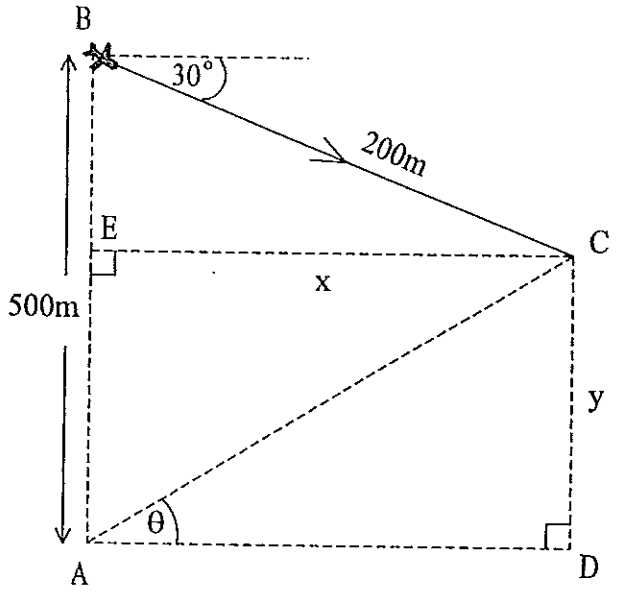
11.



The diagram shows a cylinder of radius r cm and height 8cm surmounted by a hemisphere.

Given that the volume of the hemisphere is equal to the volume of the cylinder, find the radius of the hemisphere.

QUESTION 12 (3 marks)



NOT TO SCALE

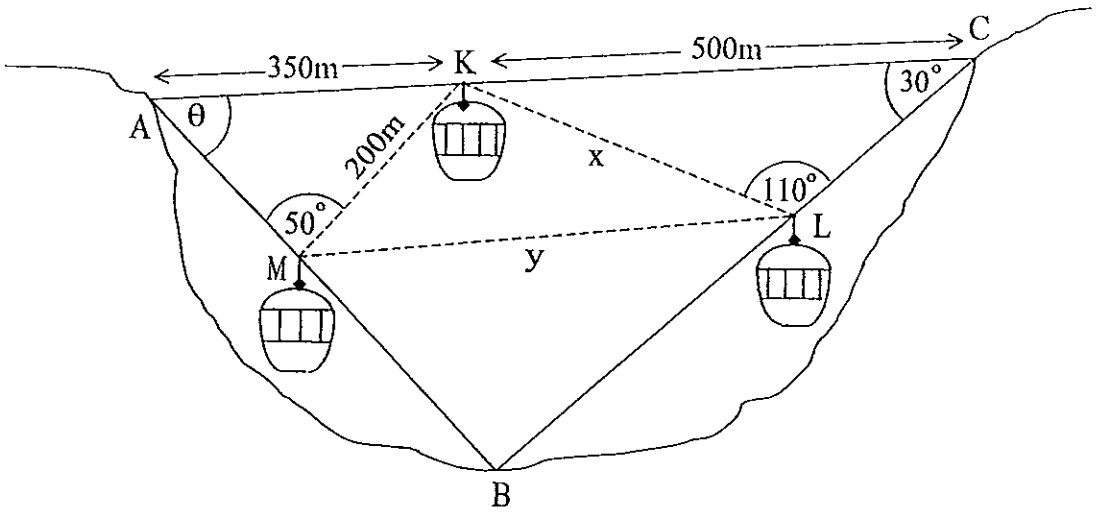
Alex's plane is at the point B 500m above a ground radar station at A.
The plane is descending towards C at an angle of 30° below the horizontal.

a) Find the horizontal distance x travelled when the plane reaches C.
Answer correct to the nearest centimetre.

b) Find the height y of the plane at point C.

c) Find the angle of elevation θ of the aircraft at C from A.
Answer correct to the nearest minute.

QUESTION 13 (3 marks)



NOT TO SCALE

Three cables AB, BC and AC form a vertical triangular scenic ride system over a valley. At a certain time, 3 cabins are hanging at K, L and M as shown.

a) Find the distance x between the two cabins K and L to the nearest metre.

b) Find the acute angle θ between the cables AC and AB to the nearest minute.

c) Find the distance y between the two cabins M and L to the nearest metre.