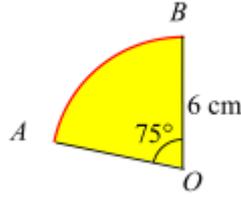


1. [AHS 16]

The diagram shows a sector  $AOB$  with radius 6 cm. Angle  $AOB$  is  $75^\circ$ .

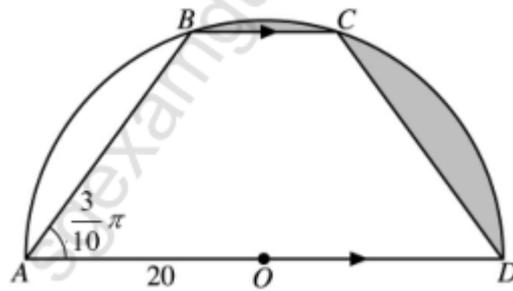


- (a) Express  $75^\circ$  in radians. [1]
- (b) Hence, find the area of the sector  $AOB$ . [1]
- (c) Find the perimeter of the sector  $AOB$ . [1]

2. [MGH 16 (modified)]

In the diagram,  $OABCD$  is a semicircle with centre at  $O$ .

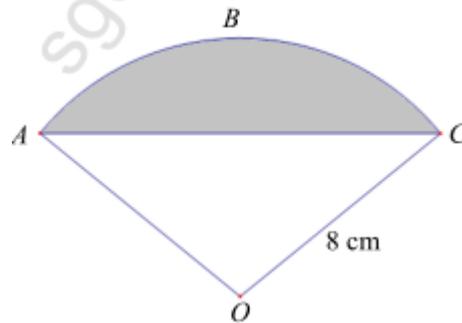
$AD$  is parallel to  $BC$ , angle  $CDA = \text{angle } BAD = \frac{3}{10}\pi$  radians and  $OA = 20$  mm.



- (a) Show that angle  $BOA = \frac{2}{5}\pi$  rad. [1]
- (b) Find the length of arc  $AB$ , leaving your answer in terms of  $\pi$ . [1]
- (c) Find angle  $BOC$ . [1]
- (d) Calculate the area of the shaded region. [3]
- (e) Find angle  $BOA$  in degrees. [1]

3. [CHIJSNGS 16]

$OAC$  is a sector of a circle, centre  $O$  and radius 8 cm. The perimeter of the sector is 30 cm.

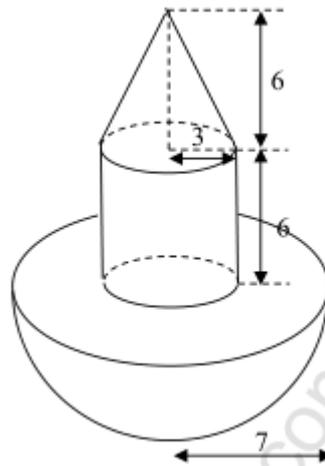


- (a) Show that angle  $AOC = 1.75$  radians.  
(b) Calculate the area of the shaded region.

[1]  
[3]

4. [CHIJSNGS 16]

A gold solid is formed by joining the plane faces of a cone, a cylinder and a hemisphere. The cone and cylinder have a base radius of 3 cm and height 6 cm. The hemisphere has a radius of 7 cm.



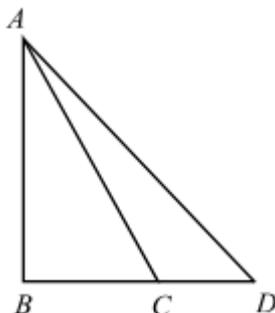
Calculate

- (a) the length of the slant height of the cone,  
(b) the surface area of the gold solid,  
(c) the volume of the gold solid.

[2]  
[3]  
[2]

5. [FSS 16]

In the diagram,  $BCD$  is a straight line. It is given that  $AB = 8$  cm,  $CD = 3$  cm,  $\angle ABC = 90^\circ$  and  $\tan \angle BCA = \frac{4}{3}$ .



- (a) Find the length of  $BC$ .
- (b) Write down  $\cos \angle ACD$ .
- (c) Find the area of triangle  $ACD$ .

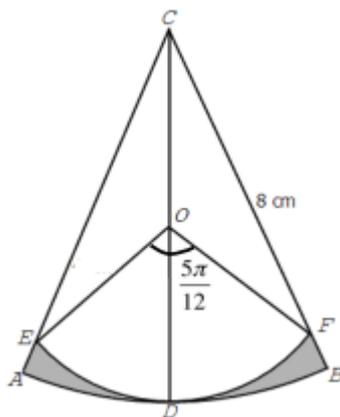
[1]  
[1]  
[1]

6. [MS 16]

In the figure, the sector  $CAB$  has centre  $C$  and radius 8 cm.  $CD$  bisects  $\angle ACB$  and  $O$  is the midpoint of  $CD$ .

An arc with centre  $O$ , is drawn to meet  $CA$  and  $CB$  at  $E$  and  $F$  respectively.

It is given that  $\angle EOF = \frac{5\pi}{12}$  and  $\angle F = \frac{5}{24}\pi$ .



- (a) Find the length of arc  $ADB$ .
- (b) Find the area of the sector  $CAB$ .
- (c) Find the area of the shaded region  $ADBFE$ .

[1]  
[1]  
[3]