

4.

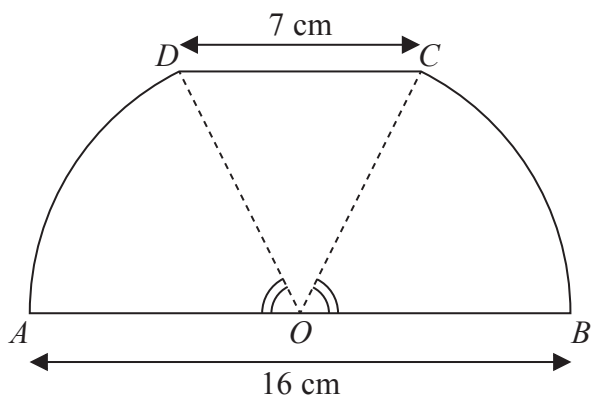


Figure 1

Figure 1 shows a sketch of a design for a scraper blade. The blade $AOBCDA$ consists of an isosceles triangle COD joined along its equal sides to sectors OBC and ODA of a circle with centre O and radius 8 cm. Angles AOD and BOC are equal. AOB is a straight line and is parallel to the line DC . DC has length 7 cm.

- (a) Show that the angle COD is 0.906 radians, correct to 3 significant figures. (2)

- (b) Find the perimeter of $AOBCDA$, giving your answer to 3 significant figures. (3)

- (c) Find the area of $AOBCDA$, giving your answer to 3 significant figures. (3)

6. (a) Find

$$\int 10x(x^{\frac{1}{2}} - 2) dx$$

giving each term in its simplest form.

(4)

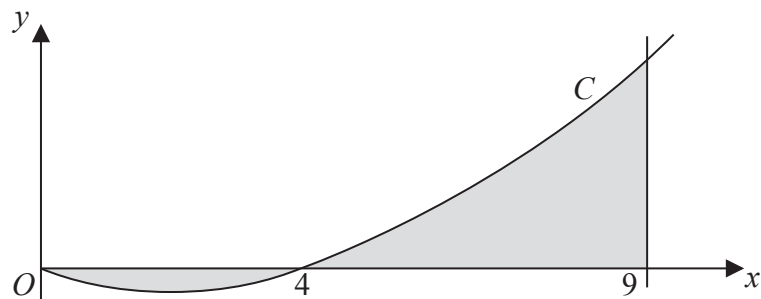


Figure 2

Figure 2 shows a sketch of part of the curve C with equation

$$y = 10x(x^{\frac{1}{2}} - 2), \quad x \geq 0$$

The curve C starts at the origin and crosses the x -axis at the point $(4, 0)$.

The area, shown shaded in Figure 2, consists of two finite regions and is bounded by the curve C , the x -axis and the line $x = 9$

(b) Use your answer from part (a) to find the total area of the shaded regions.

(5)



