

7.

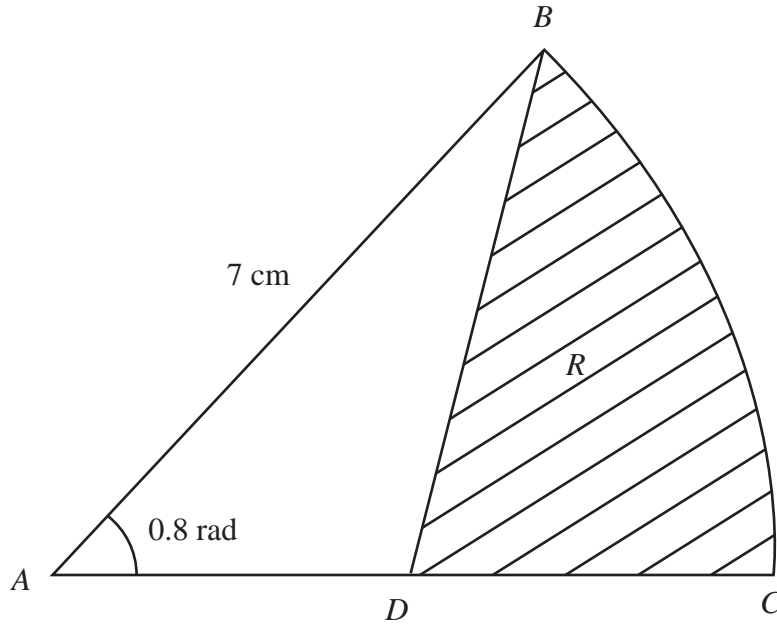


Figure 1

Figure 1 shows ABC , a sector of a circle with centre A and radius 7 cm.

Given that the size of $\angle BAC$ is exactly 0.8 radians, find

- (a) the length of the arc BC , (2)
- (b) the area of the sector ABC . (2)

The point D is the mid-point of AC . The region R , shown shaded in Figure 1, is bounded by CD , DB and the arc BC .

Find

- (c) the perimeter of R , giving your answer to 3 significant figures, (4)
- (d) the area of R , giving your answer to 3 significant figures. (4)



8.

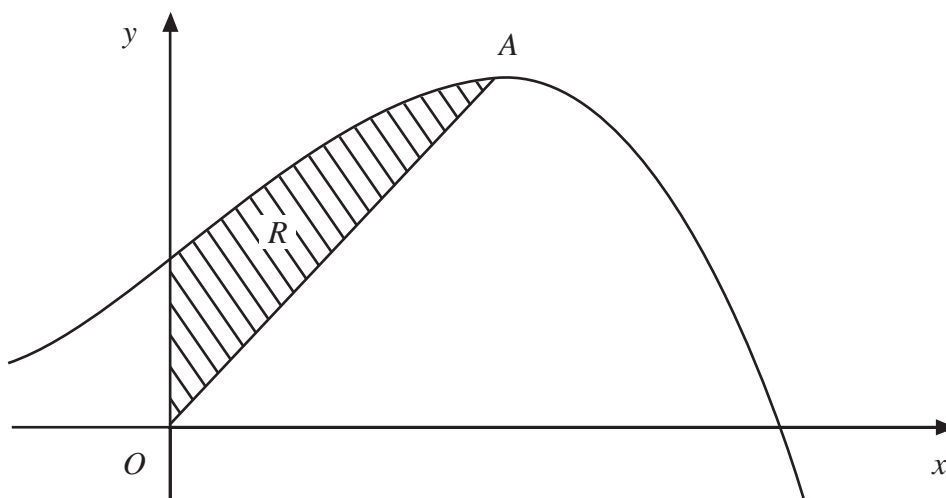


Figure 2

Figure 2 shows a sketch of part of the curve with equation $y = 10 + 8x + x^2 - x^3$.

The curve has a maximum turning point A .

- (a) Using calculus, show that the x -coordinate of A is 2. **(3)**

The region R , shown shaded in Figure 2, is bounded by the curve, the y -axis and the line from O to A , where O is the origin.

- (b) Using calculus, find the exact area of R . **(8)**



