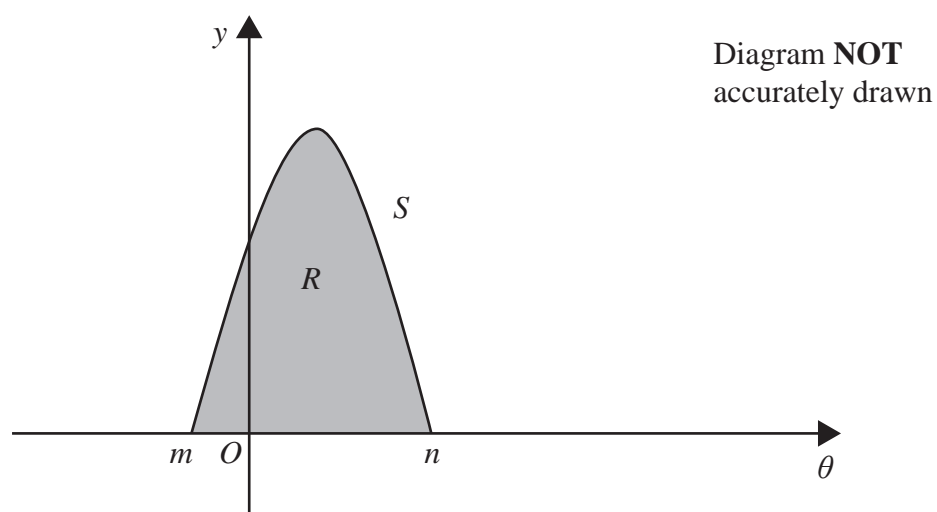**7**

Diagram **NOT**
accurately drawn

Figure 2

Figure 2 shows part of the curve S with equation $y = \left(\cos 3\theta + \sqrt{3} \sin 3\theta \right)^{\frac{1}{2}}$

where $m \leqslant \theta \leqslant n$

The curve S meets the x-axis at the point with coordinates $(m, 0)$ and at the point with coordinates $(n, 0)$

(a) Find the exact value of m and the exact value of n

(3)

The finite region R, shown shaded in Figure 2, is bounded by the curve S, and the x-axis in the region $m \leqslant \theta \leqslant n$

The region R is rotated through 2π radians about the theta-axis.

(b) Use calculus to find the exact volume of the solid generated.

(4)

Question 7 continued

Question 7 continued

Question 7 continued

(Total for Question 7 is 7 marks)

P 7 4 2 8 4 A 0 1 9 3 2