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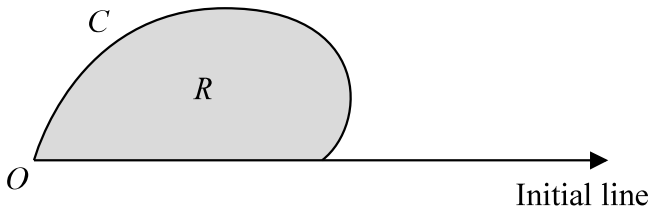


Figure 1

The curve C shown in Figure 1 has polar equation

$$r = \sin\theta + \cos 2\theta \qquad 0 \leqslant \theta \leqslant \frac{\pi}{2}$$

At the point P on C the tangent to C is parallel to the initial line.

Given that O is the pole,

(a) find the length of the line of OP, giving your answer to 3 significant figures.

(6)

The region R, shown shaded in Figure 1, is bounded by the curve C and the initial line.

(b) Use calculus to find the exact area of R.

(6)

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TOTAL FOR PAPER: 75 MARKS

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