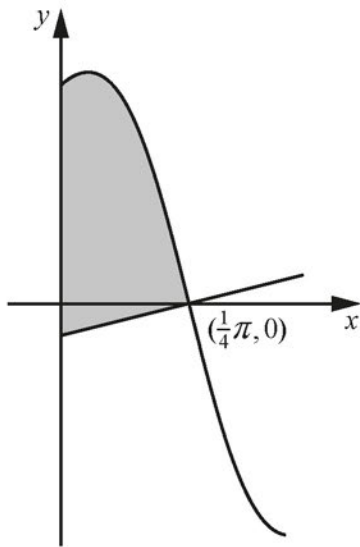


12 In this question you must show detailed reasoning.



The diagram shows the curve $y = \frac{4 \cos 2x}{3 - \sin 2x}$, for $x \geq 0$, and the normal to the curve at the point $(\frac{1}{4}\pi, 0)$. Show that the exact area of the shaded region enclosed by the curve, the normal to the curve and the y -axis is $\ln \frac{9}{4} + \frac{1}{128} \pi^2$.

[10]