

IB Calculus Problem 15

Let $f(x) = 3\cos 2x + \sin^2 x$.

A. Show that $f'(x) = -5\sin 2x$.

B. In the interval $\frac{\pi}{4} \leq x \leq \frac{3\pi}{4}$, a normal to the graph of f has equation $x = k$.
Find the value of k .