E. As x varies over the real numbers, the largest value taken by the function

$$\left(4\sin^2 x + 4\cos x + 1\right)^2$$

equals

(a) $17+12\sqrt{2}$,   (b)   36,   (c) $48\sqrt{2}$,   (d) $64-12\sqrt{3}$,   (e)   81.