

- 9 (a) Express $\cos \theta + 2 \sin \theta$ in the form $R \cos(\theta - \alpha)$, where $0 < \alpha < \frac{1}{2} \pi$ and R is positive and given in exact form. [4]

The function $f(\theta)$ is defined by $f(\theta) = \frac{1}{(k + \cos \theta + 2 \sin \theta)}$, $0 \leq \theta \leq 2\pi$, k is a constant.

- (b) The maximum value of $f(\theta)$ is $\frac{(3 + \sqrt{5})}{4}$.

Find the value of k .

[3]