

7 In this question you must show detailed reasoning.

(a) Show that the equation $m \sec \theta + 3 \cos \theta = 4 \sin \theta$ can be expressed in the form

$$m \tan^2 \theta - 4 \tan \theta + (m + 3) = 0.$$

[3]

(b) It is given that there is only one value of θ , for $0 < \theta < \pi$, satisfying the equation $m \sec \theta + 3 \cos \theta = 4 \sin \theta$.

Given also that m is a negative integer, find this value of θ , correct to **3** significant figures.

[5]