3. (a) Given that θ is small and in radians, use the small angle approximations to show that the equation

$$\cos\left(\frac{\theta}{2}\right) + 4\sin\theta - \theta^2 = \frac{5}{4} \qquad \text{(I)}$$

can be written as

$$9\theta^2 - 32\theta + 2 \approx 0$$

(3)

The solutions of the equation

$$9\theta^2 - 32\theta + 2 = 0$$

are $\theta = 0.0636$ and $\theta = 3.49$, each correct to 3 significant figures.

(b) Comment on the validity of each of these values as solutions to equation (I)

(1)