

1. (a) Given that θ is small and in radians, show that the equation

$$\cos \theta - \sin \left(\frac{1}{2} \theta \right) + 2 \tan \theta = \frac{11}{10} \quad (\text{I})$$

can be written as

$$5\theta^2 - 15\theta + 1 \approx 0 \quad (\text{3})$$

The solutions of the equation

$$5\theta^2 - 15\theta + 1 = 0$$

are 0.068 and 2.932, correct to 3 decimal places.

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

(1)