

9. Solve, for  $360^\circ \leq x < 540^\circ$ ,

$$12\sin^2 x + 7\cos x - 13 = 0$$

Give your answers to one decimal place.

(Solutions based entirely on graphical or numerical methods are not acceptable.)

(5)

because  $\sin^2 x + \cos^2 x = 1$ ,

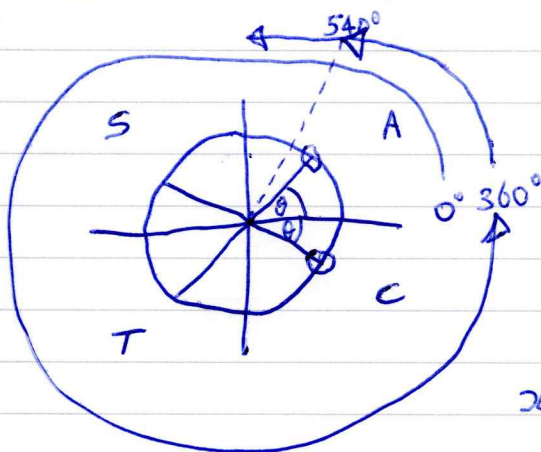
$$12(1 - \cos^2 x) + 7\cos x - 13 = 0 \quad (1 \text{ mark})$$

$$\Rightarrow 12\cos^2 x - 7\cos x + 1 = 0 \quad (1 \text{ mark})$$

solving quadratic  $\Rightarrow \cos x = \frac{1}{3}, \frac{1}{4} \quad (1 \text{ mark})$

$$\cos^{-1}\left(\frac{1}{3}\right) = 70.528\dots^\circ$$

$$\cos^{-1}\left(\frac{1}{4}\right) = 75.522\dots^\circ \quad (1 \text{ mark})$$



so, in range,

$$x = 360^\circ + 70.528\dots, \\ 360^\circ + 75.522\dots$$

$$x = 430.5^\circ, 435.5^\circ \text{ 1dp}$$

(1 mark)