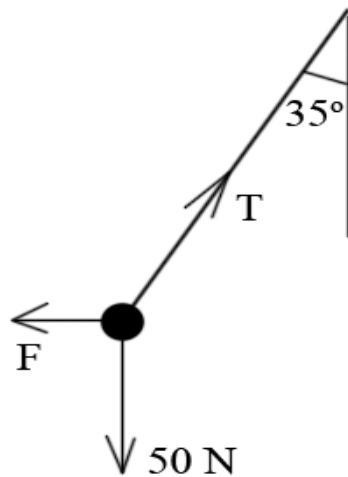Question #77507, Physics / Classical Mechanics

A particle whose weight is 50N is suspended by a light string which is at 35degrees to the vertical under the action of a horizontal force F. FIND

(i)the tension in the string

(ii)F

Solution

(diagram is not to scale)

Since the forces are in equilibrium, setting up the equations.

$$\begin{cases} \sum F_x = 0 \\ \sum F_y = 0 \end{cases};$$

$$\begin{cases} -F + T\sin 35° = 0 \\ -50 + T\cos 35° = 0 \end{cases}$$

Solving for *F* and *T*, obtaining

(i) *T* = 61 N;

(ii) *F* = 35 N.