

Modelling with Statics

Remember to include additional forces such as weight, tension, thrust, normal reaction, friction etc.

Example

A light, inextensible string of length 50cm has its upper end fixed at a point A and comes with a particle of mass 8kg at its lower end. A horizontal force P applied to the particle keeps it in equilibrium 30cm from the vertical through A.

By resolving horizontally and vertically, find the magnitude of P and the tension in the string.

Example

A light, inextensible string passes over a smooth pulley fixed at the top of a smooth plane inclined at 30° to the horizontal. A particle of mass 2kg is attached to one end of the string and hangs freely. A mass m is attached to the other end of the string and rests in equilibrium on the surface of the plane.

Calculate the normal reaction between the mass m and the plane, the tension in the string and the value of m .

Test Your Understanding (EdExcel M1 May 2013(R) Q2)

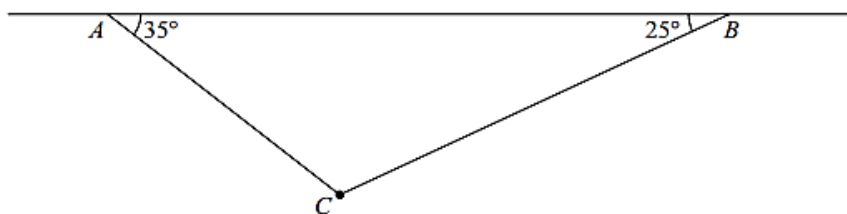


Figure 1

A particle of weight 8 N is attached at C to the ends of two light inextensible strings AC and BC . The other ends, A and B , are attached to a fixed horizontal ceiling. The particle hangs at rest in equilibrium, with the strings in a vertical plane. The string AC is inclined at 35° to the horizontal and the string BC is inclined at 25° to the horizontal, as shown in Figure 1. Find

- (i) the tension in the string AC ,
- (ii) the tension in the string BC .

(8)