

Year 2 Applied Chapter 7: Light Inextensible Strings
Exam Questions (Total Marks 42)

Q1.

A particle P of mass 2 kg is attached to one end of a light string, the other end of which is attached to a fixed point O . The particle is held in equilibrium, with OP at 30° to the downward vertical, by a force of magnitude F newtons. The force acts in the same vertical plane as the string and acts at an angle of 30° to the horizontal, as shown in Figure 3.

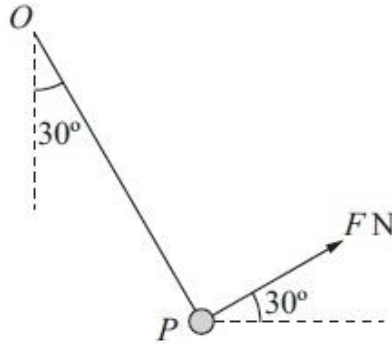


Figure 3

Find

- (i) the value of F ,
- (ii) the tension in the string.

(8)

(Total 8 marks)

Q2.

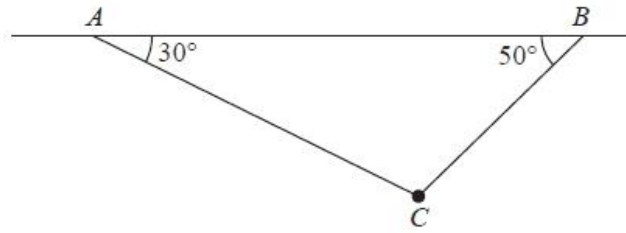


Figure 1

A particle of weight W newtons is attached at C to two light inextensible strings AC and BC . The other ends of the strings are attached to fixed points A and B on a horizontal ceiling. The particle hangs in equilibrium with AC and BC inclined to the horizontal at 30° and 50° respectively, as shown in Figure 1.

Given that the tension in BC is 6 N, find

(a) the tension in AC ,

(3)

(b) the value of W .

(3)

(Total 6 marks)

Q3.

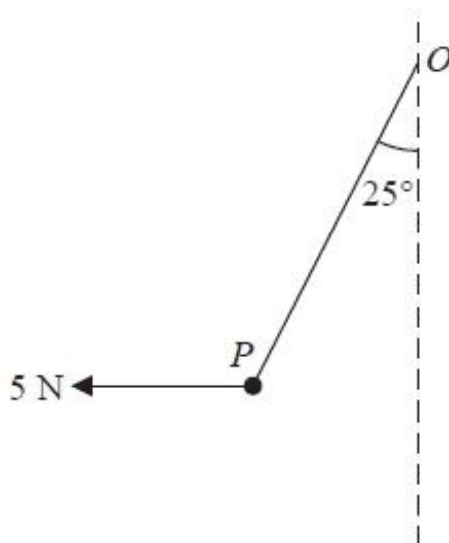


Figure 1

A particle P of weight W newtons is attached to one end of a light inextensible string. The other end of the string is attached to a fixed point O . A horizontal force of magnitude 5 N is applied to P . The particle P is in equilibrium with the string taut and with OP making an angle of 25° to the downward vertical, as shown in Figure 1.

Find

(a) the tension in the string,

(3)

(b) the value of W .

(3)

(Total 6 marks)

Q4.

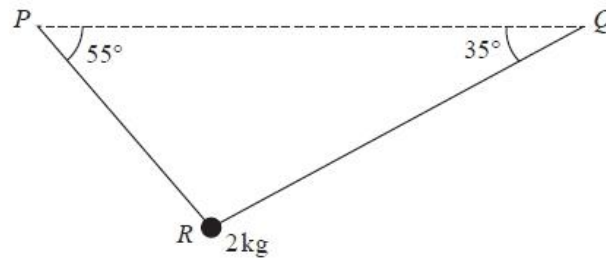


Figure 1

A particle of mass 2 kg is suspended from a horizontal ceiling by two light inextensible strings, PR and QR . The particle hangs at R in equilibrium, with the strings in a vertical plane. The string PR is inclined at 55° to the horizontal and the string QR is inclined at 35° to the horizontal, as shown in Figure 1.

Find

- (i) the tension in the string PR ,
- (ii) the tension in the string QR .

(7)
(Total for question = 7 marks)

Q5.

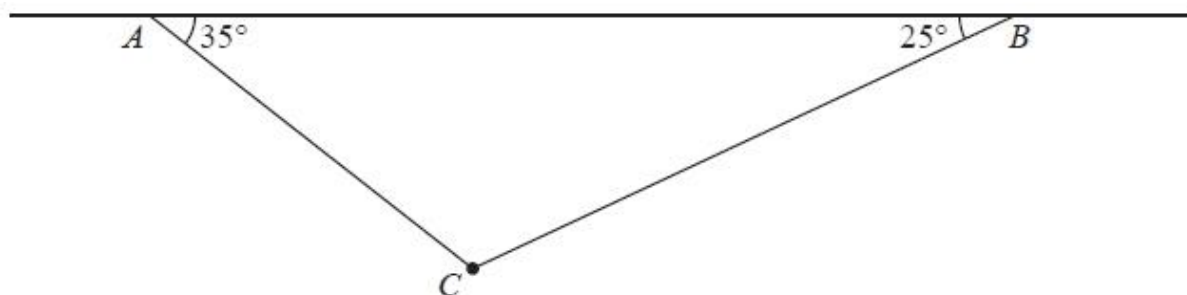


Figure 1

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

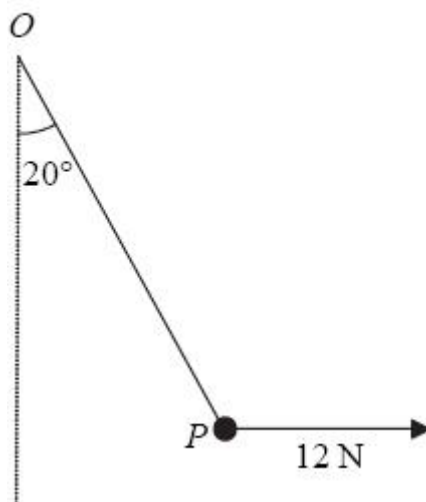
- (i) the tension in the string AC,
- (ii) the tension in the string BC.

(8)

(Total 8 marks)

Q6.

Figure 1



A particle P is attached to one end of a light inextensible string. The other end of the string is attached to a fixed point O . A horizontal force of magnitude 12 N is applied to P . The particle P is in equilibrium with the string taut and OP making an angle of 20° with the downward vertical, as shown in Figure 1.

Find

(a) the tension in the string,

(3)

(b) the weight of P .

(4)

(Total 7 marks)