

- 2 A climber is supported by a rope on a vertical wall, as shown in Fig. 2.1.

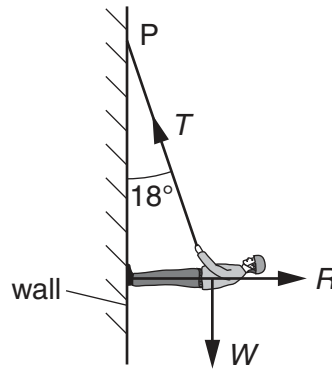


Fig. 2.1

The weight W of the climber is 520 N. The rope, of negligible weight, is attached to the climber and to a fixed point P where it makes an angle of 18° to the vertical. The reaction force R acts at right-angles to the wall.

The climber is in equilibrium.

- (a) State the conditions necessary for the climber to be in equilibrium.

.....

.....

.....[2]

- (b) Complete Fig. 2.2 by drawing a labelled vector triangle to represent the forces acting on the climber.



Fig. 2.2

(c) Resolve forces or use your vector triangle to calculate

(i) the tension T in the rope,

$$T = \dots\dots\dots \text{ N [2]}$$

(ii) the reaction force R .

$$R = \dots\dots\dots \text{ N [1]}$$

(d) The climber moves up the wall and the angle the rope makes with the vertical increases. Explain why the magnitude of the tension in the rope increases.

.....

 [1]