

- 9 An aluminium wire of length 1.8 m and area of cross-section $1.7 \times 10^{-6} \text{ m}^2$ has one end fixed to a rigid support. A small weight hangs from the free end, as illustrated in Fig. 9.1.

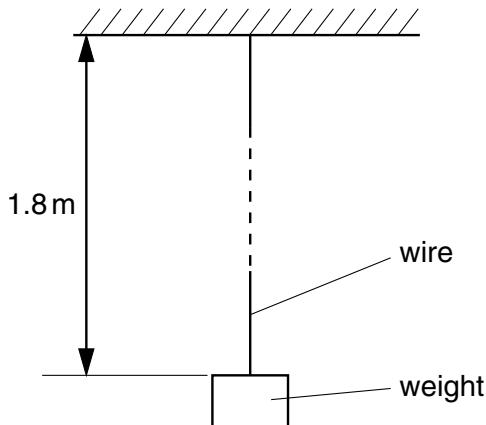


Fig. 9.1

The resistance of the wire is 0.030Ω and the Young modulus of aluminium is $7.1 \times 10^{10} \text{ Pa}$.

The load on the wire is increased by 25 N.

(a) Calculate

(i) the increase in stress,

$$\text{increase} = \dots \text{ Pa}$$

(ii) the change in length of the wire.

$$\text{change} = \dots \text{ m}$$

[4]

- (b) Assuming that the area of cross-section of the wire does not change when the load is increased, determine the change in resistance of the wire.

change = Ω [3]

