6.

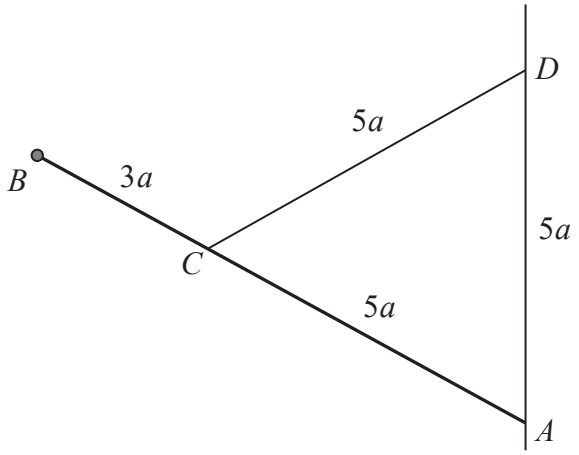


Figure 4

A uniform rod AB has length $8a$ and weight W.

The end A of the rod is freely hinged to a fixed point on a vertical wall.

A particle of weight $\frac{1}{4}W$ is attached to the rod at B.

A light inelastic string of length $5a$ has one end attached to the rod at the point C, where $AC = 5a$.

The other end of the string is attached to the wall at the point D, where D is above A and $AD = 5a$, as shown in Figure 4.

The rod rests in equilibrium.

The tension in the string is T.

(a) Show that $T = \frac{6}{5}W$

(3)

(b) Find, in terms of W, the magnitude of the force exerted on the rod by the hinge at A.

(6)

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Question 6 continued

(Total for Question 6 is 9 marks)