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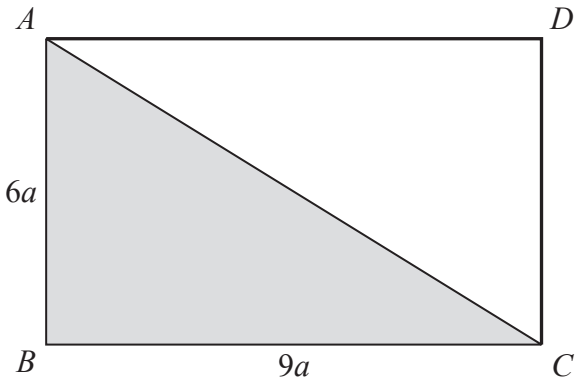


Figure 3

The model of the design for a pendant consists of a uniform triangular lamina, ABC, and two uniform rods AD and DC, as shown in Figure 3. The rods are in the same plane as the lamina. The lamina ABC has mass $8M$, sides $AB = 6a$ and $BC = 9a$, and angle $ABC = 90°$. The rod AD has mass $2M$ and length $9a$. The rod DC has mass kM and length $6a$.

(a) Show that the centre of mass of the model is $\left(\frac{33 + 9k}{10 + k}\right)a$ from AB.

(4)

The model is suspended from A and hangs freely in equilibrium with AC vertical.

(b) Find the value of k.

(7)

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