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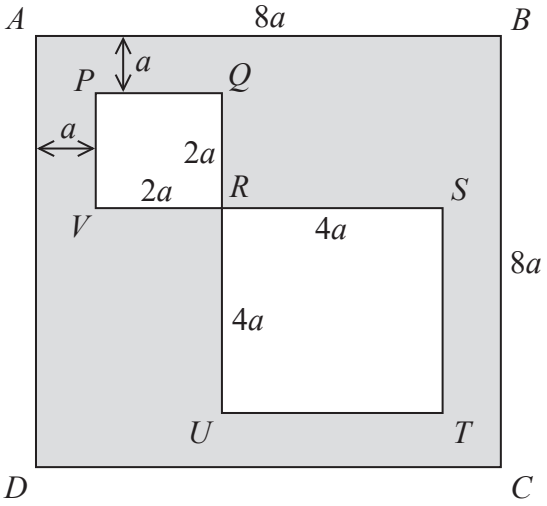


Figure 2

The uniform lamina L, shown shaded in Figure 2, is formed by removing the square $PQRV$, of side $2a$, and the square $RSTU$, of side $4a$, from a uniform square lamina $ABCD$, of side $8a$. The lines QRU and VRS are straight. The side AD is parallel to PV and the side AB is parallel to PQ. The distance between AD and PV is a and the distance between AB and PQ is a. The centre of mass of L is at the point G.

(a) Show that the distance of G from the side AD is $\frac{42}{11}a$

(5)

The mass of L is M. A particle of mass kM is attached to L at C.

The lamina, with the attached particle, is freely suspended from B and hangs in equilibrium with BC making an angle of 45° with the horizontal.

(b) Find the value of k.

(4)

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