3.

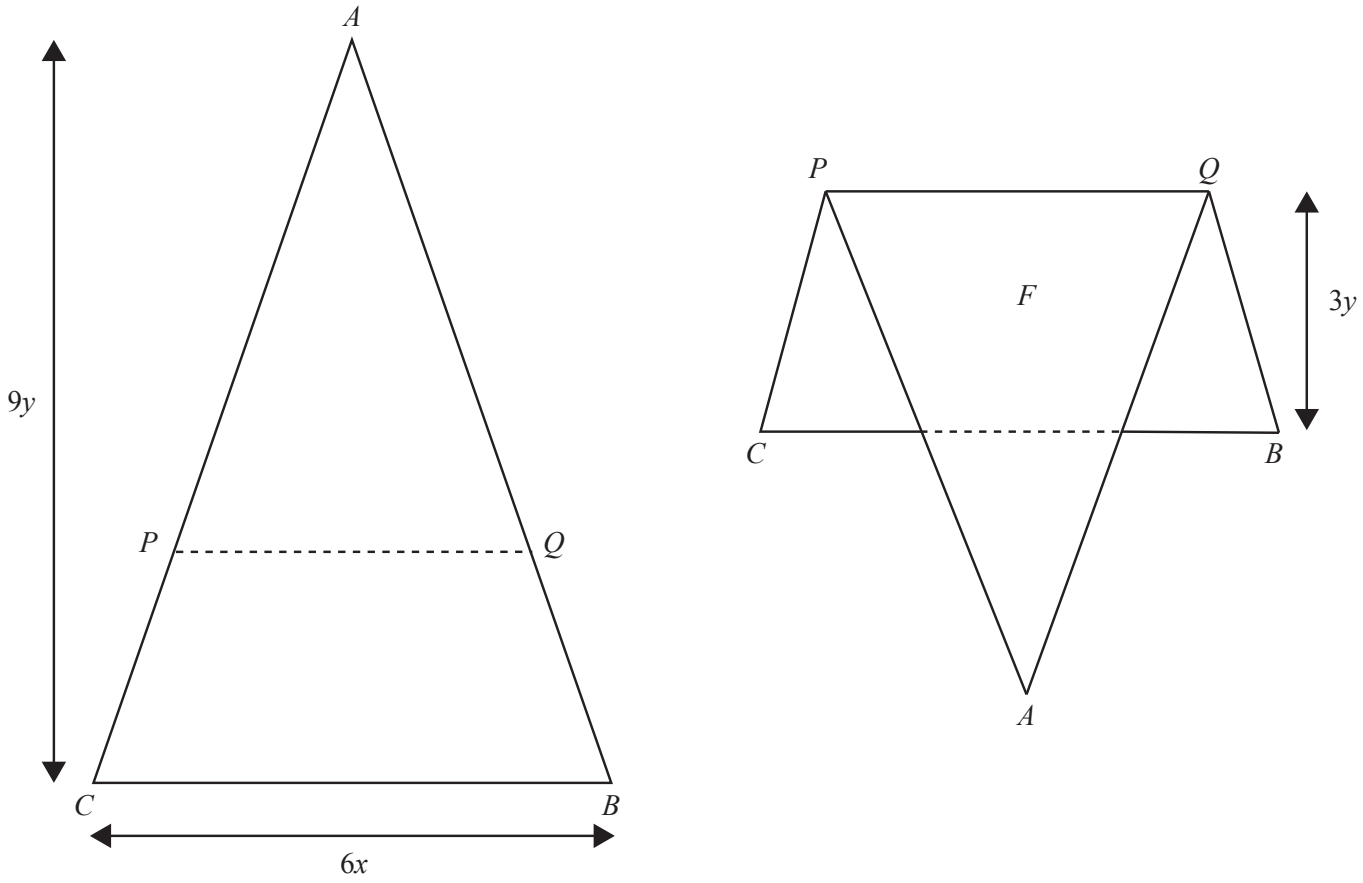


Figure 1

The uniform triangular lamina ABC, shown in Figure 1, has height $9y$, base $BC = 6x$, and $AB = AC$

The points P and Q are such that $AP : PC = AQ : QB = 2 : 1$

The lamina is folded along PQ to form the folded lamina F

The distance of the centre of mass of F from PQ is d

(a) Show that $d = \frac{16}{9}y$

(5)

The folded lamina is suspended from P and hangs freely in equilibrium with PQ at an angle α to the downward vertical.

Given that $\tan\alpha = \frac{64}{81}$

(b) find x in terms of y

(3)

DO NOT WRITE IN THIS AREA
DO NOT WRITE IN THIS AREA
DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA
DO NOT WRITE IN THIS AREA
DO NOT WRITE IN THIS AREA

Question 3 continued

Question 3 continued

DO NOT WRITE IN THIS AREA
DO NOT WRITE IN THIS AREA
DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA
DO NOT WRITE IN THIS AREA
DO NOT WRITE IN THIS AREA

Question 3 continued

(Total for Question 3 = 8 marks)