

- 3 A uniform plank AB of length 5.0 m and weight 200 N is placed across a stream, as shown in Fig. 3.1.

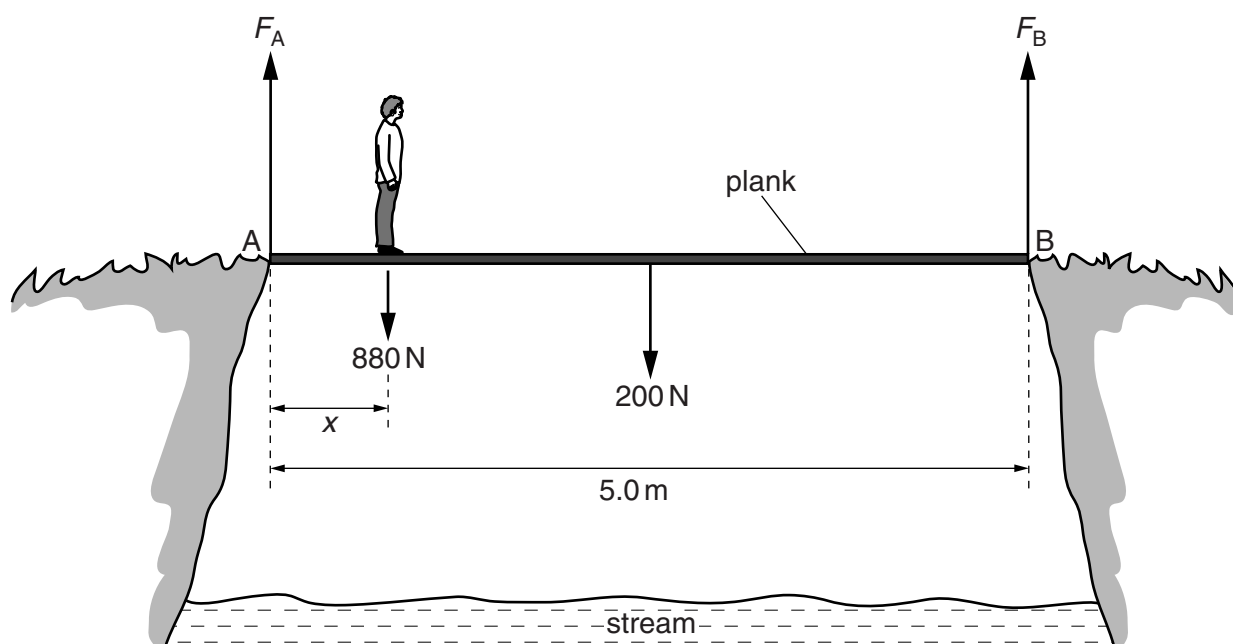


Fig. 3.1

A man of weight 880 N stands a distance x from end A. The ground exerts a vertical force F_A on the plank at end A and a vertical force F_B on the plank at end B. As the man moves along the plank, the plank is always in equilibrium.

- (a) (i) Explain why the sum of the forces F_A and F_B is constant no matter where the man stands on the plank.

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 [2]

- (ii) The man stands a distance $x = 0.50$ m from end A. Use the principle of moments to calculate the magnitude of F_B .

$F_B = \dots\dots\dots$ N [4]

(b) The variation with distance x of force F_A is shown in Fig. 3.2.

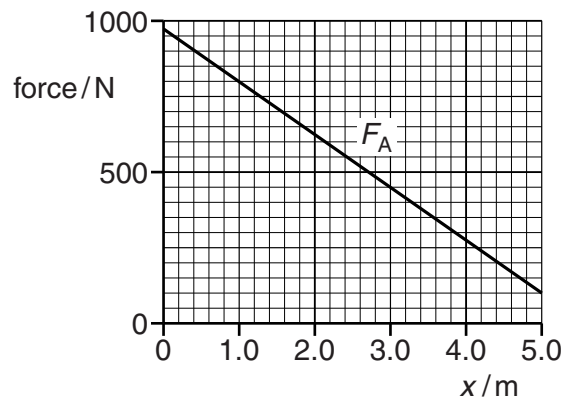


Fig. 3.2

On the axes of Fig. 3.2, sketch a graph to show the variation with x of force F_B .

[3]