

- 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.

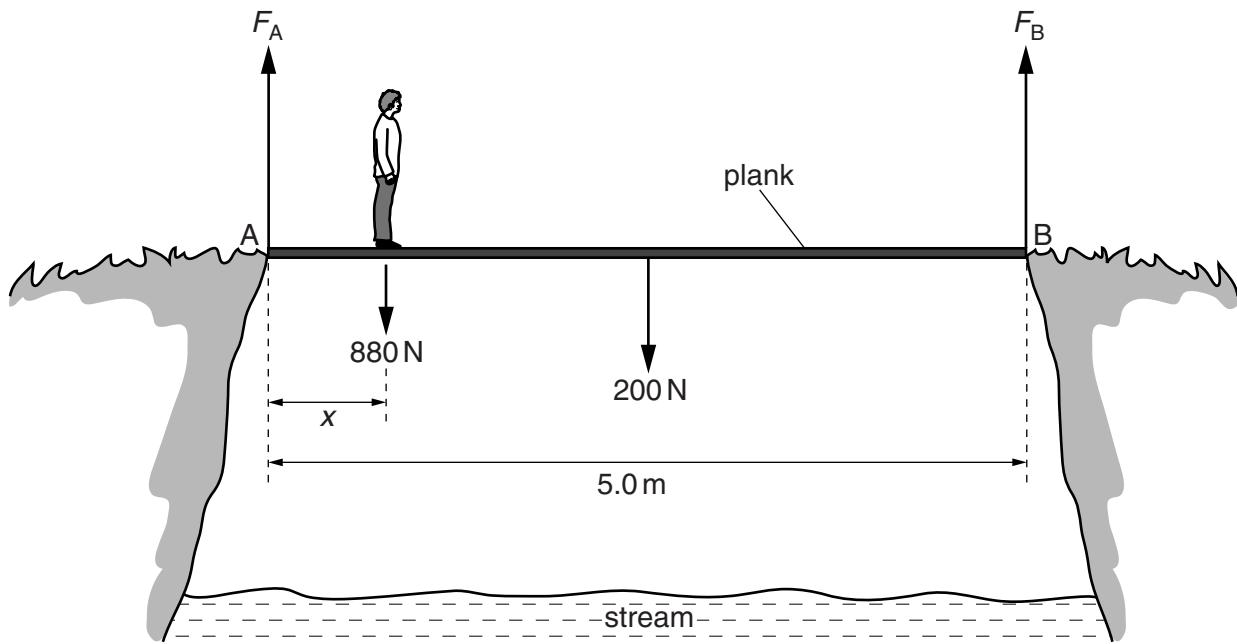


Fig. 3.1

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.

.....
.....
.....

[2]

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

$$F_B = \dots \text{N} [4]$$

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

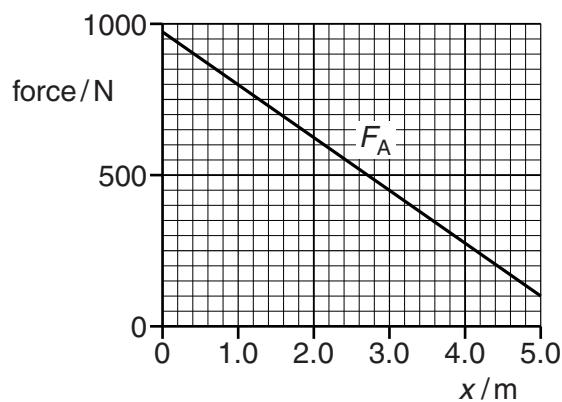


Fig. 3.2

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

[3]