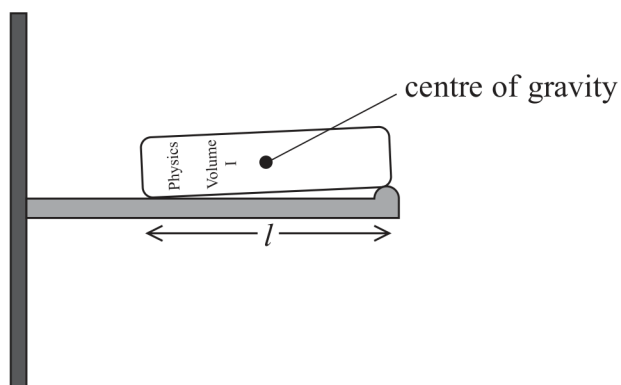


- 13 A book of length l and weight W is positioned on a shelf as shown.

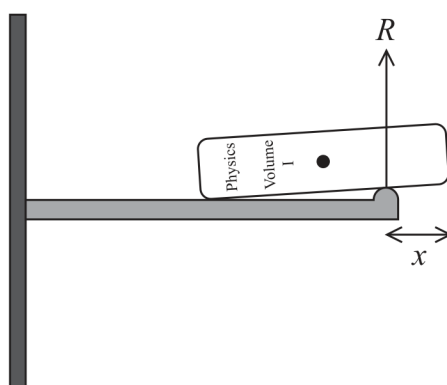


- (a) State what is meant by centre of gravity.

(1)

- (b) There are contact forces at the two positions where the book touches the shelf.

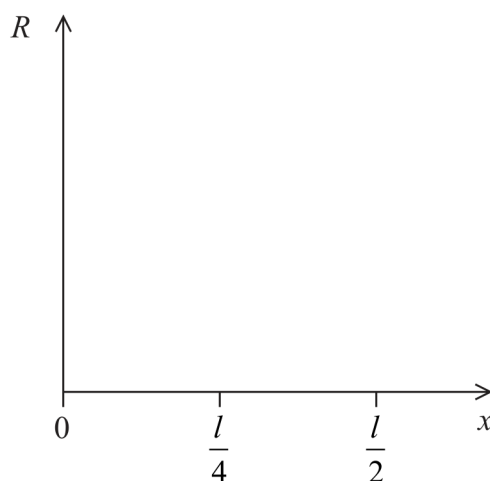
The book is moved a distance x to the right as shown.



The magnitude of the contact force R varies with x .

Sketch on the axes below the variation of R with x between 0 and $\frac{l}{2}$. You should mark the maximum value of R onto the axes.

(3)



(c) Explain why the book will not remain on the shelf if $x > \frac{l}{2}$.

(2)

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(Total for Question 13 = 6 marks)