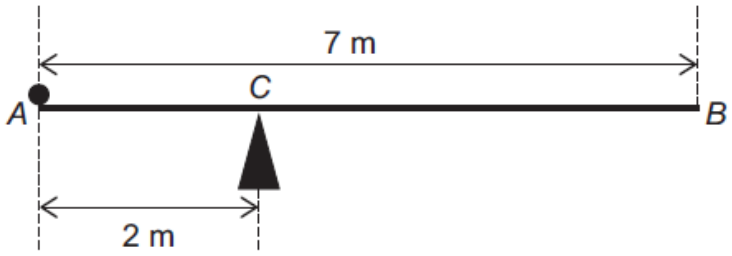
AQA – Moments – A2 Mathematics P2

1. June/2020/Paper_2/No.13

A uniform rod, AB, has length 7 metres and mass 4 kilograms.

The rod rests on a single fixed pivot point, C, where $AC = 2$ metres.

A particle of weight W newtons is fixed at A, as shown in the diagram.



The system is in equilibrium with the rod resting horizontally.

(a) Find W, giving your answer in terms of g.

[2 marks]

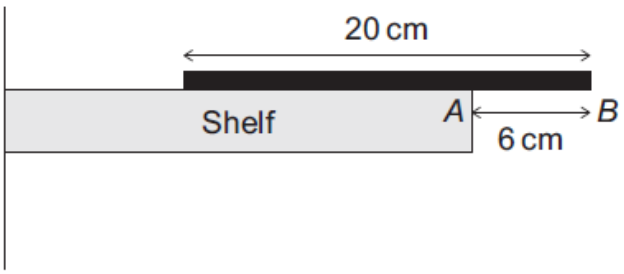
(b) Explain how you have used the fact that the rod is uniform in part **(a)**.

[1 mark]

2. June/2020/Paper_2/No.14

A metal rod, of mass m kilograms and length 20 cm, lies at rest on a horizontal shelf.

The end of the rod, *B*, extends 6 cm beyond the edge of the shelf, *A*, as shown in the diagram below.



(a) The rod is in equilibrium when an object of mass 0.28 kilograms hangs from the midpoint of *AB*.

Show that $m = 0.21$

[3 marks]

(b) The object of mass 0.28 kilograms is removed.

A number, n, of identical objects, each of mass 0.048 kg, are hung from the rod all at a distance of 1 cm from *B*.

Find the maximum value of n such that the rod remains horizontal.

[4 marks]

(c) State one assumption you have made about the rod.

[1 mark]