

8 In Fig. 8, OAB is a thin bent rod, with $OA = 1$ m, $AB = 2$ m and angle $OAB = 120^\circ$. Angles θ , ϕ and h are as shown in Fig. 8.

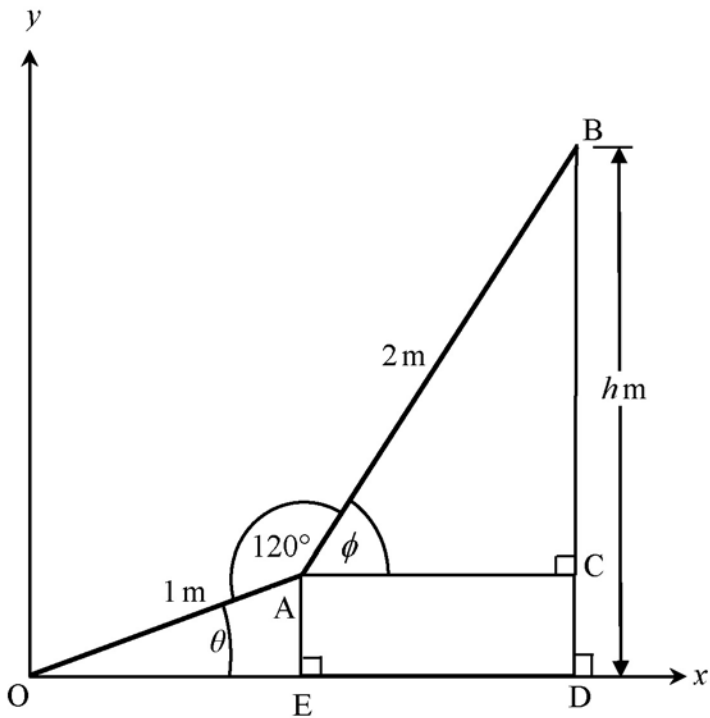


Fig. 8

(a) Show that $h = \sin \theta + 2\sin(\theta + 60^\circ)$. [3]

The rod is free to rotate about the origin so that θ and ϕ vary. You may assume that the result for h in part (a) holds for all values of θ .

(b) Find an angle θ for which $h = 0$. [5]