

STEP II, 2016, Q10

- 10 A thin uniform wire is bent into the shape of an isosceles triangle ABC , where AB and AC are of equal length and the angle at A is 2θ . The triangle ABC hangs on a small rough horizontal peg with the side BC resting on the peg. The coefficient of friction between the wire and the peg is μ . The plane containing ABC is vertical. Show that the triangle can rest in equilibrium with the peg in contact with any point on BC provided

$$\mu \geq 2 \tan \theta (1 + \sin \theta).$$



NextStepMaths.com

To view mark schemes, fully worked solutions and examiner's comments, and for more details about tutoring and other services offered, go to [NextStepMaths.com](https://www.NextStepMaths.com)