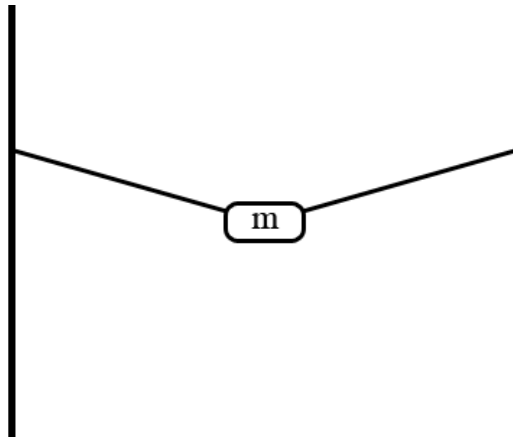Question #78469, Physics / Other

While camping you want to keep your pack away from bears, so you tie a cord between two trees and hang the pack in the middle. The cord can hold 143.18 newtons, and is pulled down at an angle of 15°. How heavy of a pack can you hang, in kg?

Solution

Since the pack does not move, the forces are balanced.

$$\sum F_y = 0;$$

$$2T\sin 15° = mg ;$$

$$m = \frac{2T\sin 15°}{g} = \frac{2 \times 143.18 \times \sin 15°}{9.81} = 7.56\,\text{kg}$$

Answer: the maximum mass of the pack is 7.56 kg.