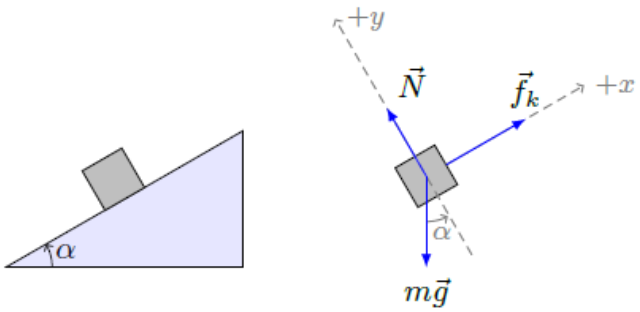
Answer on Question #66806-Physics-Other

A box of mass 50 kg is placed on an inclined plane. When the angle of the plane is increased to 30º, the box begins to slide downwards. Calculate the coefficient of static friction between the plane and the box. Draw the free body diagram.

Solution



$$mg\sin\alpha - f_k = 0$$

$$mg\cos\alpha - N = o$$

The coefficient of static friction between the plane and the box is

$$\mu = \frac{f_k}{N} = \frac{\sin\alpha}{\cos\alpha} = \tan\alpha = \tan 30 = \frac{1}{\sqrt{3}} \approx 0.577.$$