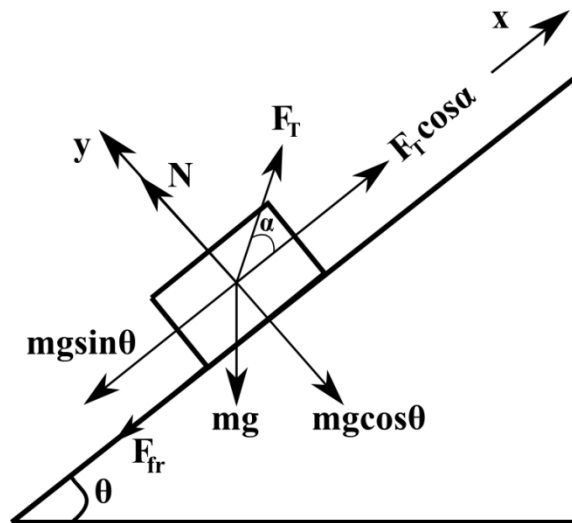


Answer on Question 51956, Physics, Other

Question:

A 20kg block on an inclined plane is pulled up the plane with rope tied to the block. The rope is at angle of 37° above the surface of the plane. The tension in the rope is 250N and the frictional force on the block is 8.0N . What is the acceleration of the block?

Solution:



Let's write all forces that acts on a the block:

$$m\vec{g} + \vec{N} + \vec{F}_T + \vec{F}_{fr} = m\vec{a}$$

Then projected the forces on axis x :

$$F_T \cos \alpha - mg \sin \theta - F_{fr} = ma,$$

From this equation we can find the acceleration of the block. Unfortunately, from the condition of the question we don't know the angle of inclination of the plane θ , so we find the acceleration of the block in symbolic form:

$$a = \frac{F_T \cos \alpha - mg \sin \theta - F_{fr}}{m}.$$

Answer:

$$a = \frac{F_T \cos \alpha - mg \sin \theta - F_{fr}}{m}.$$

<http://www.AssignmentExpert.com/>