Answer on question #55022, Physics / Quantum Mechanics

Question A 20kg block on an inclined plane is pulled up the plane with rope tied o the block. The rope is at an angle of 37 degrees 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 The total force along plane is

$$F = 250 - 8 - mg\sin 37^\circ = 250 - 8 - 20 \cdot 9.8 \cdot \sin 37^\circ \approx 123.7\,N$$

Then acceleration is

$$a = \frac{F}{m} = \frac{123.7}{20} \approx 6.2\,m/s$$