Answer on Question #62688-Physics-Mechanics-Relativity

A glider with a mass of 0.3105 kg is pulled along a track by a pulley with a 0.010kg weight at the end. Compute the acceleration of the Glider.

Solution

The second Newton's law for glider:

$$Ma = T$$

T is the tension in the rope.

The second Newton's law for hanging mass:

$$ma = mg - T.$$

Adding these equations we get:

$$(m + M)a = mg$$

The acceleration of the Glider is

$$a = \frac{m}{m + M} g = \frac{0.010}{0.010 + 0.3105} 9.81 = 0.306 \frac{m}{s^2}$$

Answer: $\mathbf{0.306 \frac{m}{s^2}}$.