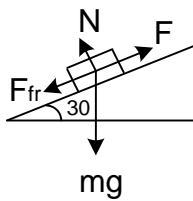**Answer on Question #79752, Physics / Mechanics**

A crate of mass 30kg is pulled by a force of 1800N up an inclined plane which makes an angle 30degree with the horizon.The coefficient of kinitic friction between the plane and the crate is 0.225.If the crates starts from the rest,calculate its speed after has been pulled 15m.Draw the free body diagram.

Solution.

Project the force to the axis X and Y:

OX: $F - F_{fr} - mg \cdot \cos(60)° = ma$

OY: $N - mg \cdot \cos(30)° = 0$

From here: $a = \frac{F - \mu mg \cdot \cos(30) - mg \cdot \cos(60)}{m} = 57.5 \frac{m}{s^2}$

$$s = \frac{v^2 - v_0^2}{2a}$$

$$v = \sqrt{2as} = \sqrt{2 \cdot 57.5 \cdot 15} = 41.5 \frac{m}{s}$$

Answer: $v = 41.5 \frac{m}{s}$