A body of mass m resting on a wedge of angle a. Given acceleration f. What is the value of f to set free the mass from inclined plane?

**Solution:**

Condition of the problem does not say the direction of acceleration $\vec{f}$, so let it be directed perpendicular to the inclined plane.

At the time of separation from the inclined plane reaction force $\overrightarrow{N_r}$ is equal to zero (the object does not touch the wedge):
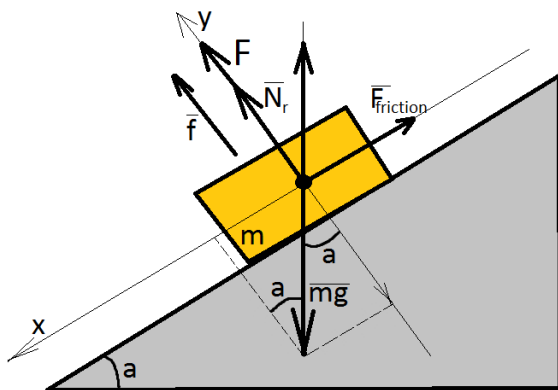


Newton's second law: $\vec{F} + \overrightarrow{mg} + \overrightarrow{N_r} + \overrightarrow{F_{friction}} = \vec{0}$

$$y: (mg)_y - F = 0$$

$$(mg)_y = mg \cdot \cos a \ \rightarrow$$

$$y: mg \cdot \cos a - F = 0 \ (1)$$

$$F = mf \ (2) \ (Newton's \ second \ law)$$

$$mg \cdot \cos a - mf = 0$$

$$f = g \cdot \cos a = 9.8 \frac{m}{s^2} \cos a$$

**Answer:** $f = 9.8 \frac{m}{s^2} \cos a$