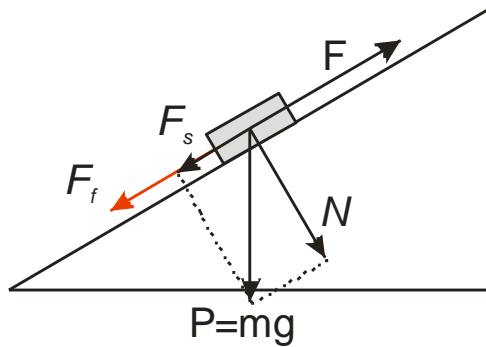


A 50 kg sled is pulled by a rope at an angle of 30 degrees above the horizontal with a force of 35 N . this is sufficient to keep the sled moving at a constant speed. What is the coefficient of sliding friction for the sled-snow surface?

Solution:



Such as the sled moving at a constant speed the force F is equal to sum of forces F_s and F_f , where F_f – frictional force

$$F = F_s + F_f$$

$$F_f = kN$$

$$kN = F - F_s$$

$$k = \frac{F - F_s}{N} = \frac{F - mg \sin 30^\circ}{mg \cos 30^\circ}$$

$$k = \frac{35 - 50 \cdot 9.8 \cdot \sin 30^\circ}{50 \cdot 9.8 \cdot \cos 30^\circ} = -0.49$$

The sign “-“ means that friction force directed to an opposite side to F

Answer: 0.49