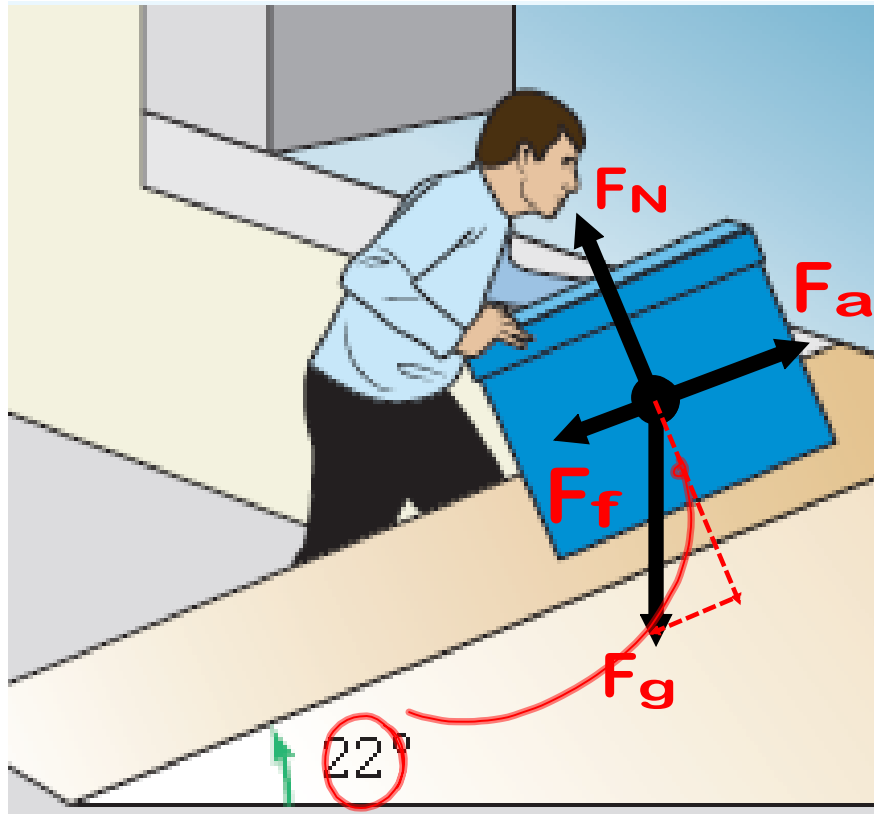


Forces on an Inclined Plane



Mar 13-8:37 PM

10. A cardboard box (of negligible mass) filled with 45 kg of paper sits on a ramp that makes an angle of 21° with the horizontal. The coefficient of static friction is 0.42.

(a) Will the box slide down the ramp?

Explain.

(b) If not, how much force would you have to apply directly down the ramp to start the box sliding?

Mar 13-8:42 PM

$F_g = mg$
 $= 45 \times 9.81$
 $= \underline{441.45 \text{ N}}$

$F_N = 441.5 (\cos 21)$
 $= 412.2 \text{ N}$

$F_f = 441.5 (\sin 21)$
 $= \underline{158.2 \text{ N}}$

$F_f = \mu F_N$
 $= (0.42)(412.2)$
 $= \underline{\underline{173.1 \text{ N}}}$