

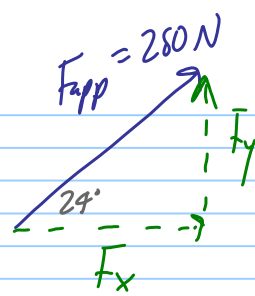
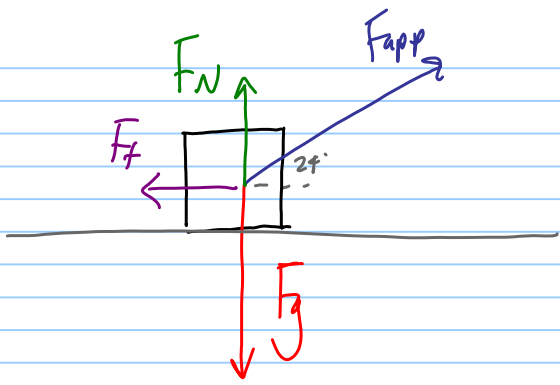
Quiz 1a

Note Title

10/10/2011

A boy pulls a 35 kg sled along flat ground by a rope that makes a 24° angle to the horizontal. He pulls with 250 N and there is 195 N of friction. If the sled is initially at rest, how fast is the sled moving after 12 m?

BONUS: What is the coefficient of friction?



$$\cos 24^\circ = \frac{F_x}{F_{app}}$$

$$F_x = F_{app} \cos 24^\circ = 228.4 \text{ N}$$

$$F_{net} = F_x - F_f = ma$$

$$a = \frac{F_x - F_f}{m} = \frac{228.4 - 195}{35} = 0.9539 \text{ m/s}^2$$

$$V = ?$$

$$V_0 = 0$$

$$a = 0.9539 \text{ m/s}^2$$

$$d = 12 \text{ m}$$

t

$$V^2 = V_0^2 + 2ad$$

$$V = \sqrt{2ad}$$

$$= 4.8 \text{ m/s}$$

Bonus:

$$F_f = \mu F_N$$

$$F_N \neq F_g$$

$$F_N + F_y = F_g$$

$$F_N = F_g - F_y$$

$$= mg - F_{app} \sin 24^\circ$$

$$= 241 \text{ N}$$

$$\mu = \frac{F_f}{F_N} = \frac{195}{241}$$

$$= 0.81$$