Quiz 3b

Note Title 18/10/2011

A skier starts at rest on a 30° slope. Assume that the coefficient of friction is 0.12.

a) Draw an FBD of the skier on the slope.

b) Determine the skier's acceleration.

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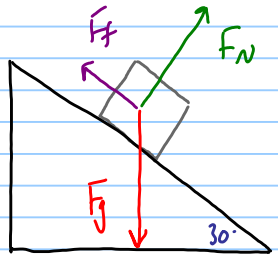
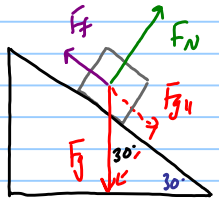
a)



✓ (No F_{app}! No F_g components!)

b)



$F_{net} = F_{g\parallel} - F_f = ma$ ✓

$F_{g\parallel} = F_g \sin 30°$
$= mg \sin 30°$ ✓

don't know m, that's ok!

$F_f = \mu F_N$
$= \mu F_{g\perp}$ ✓
$= \mu mg \cos 30°$

$$a = \frac{F_{g\parallel} - F_f}{m} = \frac{mg \sin 30° - \mu mg \cos 30}{m}$$

$$= g \sin 30° - \mu g \cos 30°$$

$$= (9.8) \sin 30° - (0.12)(9.8) \cos 30°$$

$$= \boxed{3.9 \text{ m/s}^2}$$ ✓