

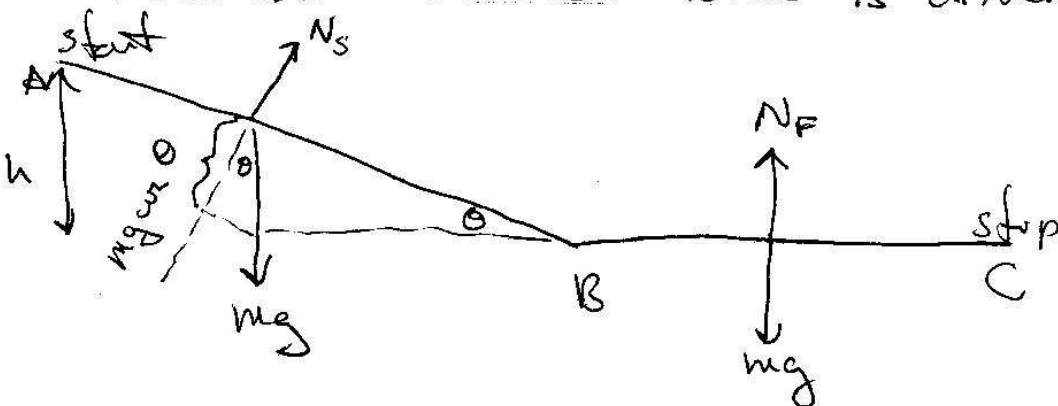
Quiz 12-2

Skier on 20° slope - how far does he go?
 Fall $h=10\text{m}$ or 20m $\mu=0.1$

$$W_{nc} = E_A - E_c$$

$$W_{nc} = F_{\text{friction}} \cdot (\text{distance}) = E_A = mgh$$

Frictional force different on slope and flat
 because Normal force is different



$$W_{nc} = \mu N_s X_{AB} + \mu N_f X_{BC}$$

$$X_{AB} = \frac{h}{\sin \theta} \quad X_{BC} = d \text{ (unknown)}$$

$$= \frac{\mu mgh}{\sin \theta} + \mu mg d = E_A = mgh$$

Cancel mg on both sides and solve for d :

$$d = h \left(\frac{1}{\mu} + \frac{1}{\sin \theta} \right) = 72.5\text{m} (h=10\text{m}) \text{ or } 145\text{m} (h=20\text{m})$$

Note: with multiple-choice answers give,
 you could forget about the reduced normal
 force on the slope and get close enough
 to the correct answer to get it right.