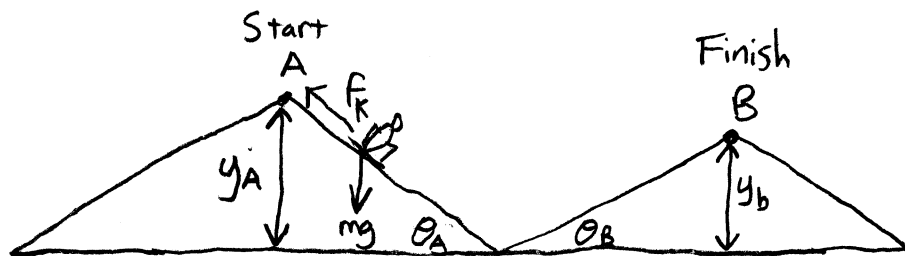


8-59



$$y_A = 950\text{m}$$

$$\theta_A = 27^\circ$$

$$y_B = 840\text{m}$$

$$\theta_B = 35^\circ$$

$$v_0 = v_f = 0$$

$$\bullet \quad \Delta K + \Delta U = W_{nc}$$

→ Skier starts from rest & finishes at rest so  $\Delta K = 0$

→ Only non-conservative force we consider is friction

$$\rightarrow \Delta U = W_F$$

$$(mgy_B - mgy_A) = W_F$$

• On each slope, Force of friction is  $F_f = -\mu_k^{\max} N$

$$F_f = -\mu_k^{\max} mg \cos \theta$$

• Length of each slope is  $l = \frac{y}{\sin \theta}$

• Work done by friction on each slope is  $F_f \cdot l = -\frac{\mu_k^{\max} mg \cos \theta \cdot y}{\sin \theta}$

$$F_f \cdot l = -\mu_k^{\max} mgy \cot \theta$$

$$\rightarrow mgy_B - mgy_A = -\mu_k^{\max} mgy_A \cot \theta_A - \mu_k^{\max} mgy_B \cot \theta_B$$

$$mgy_B - mgy_A = -\mu_k^{\max} mg(y_A \cot \theta_A + y_B \cot \theta_B)$$

$$\frac{-mgy_B + mgy_A}{mgy_A \cot \theta_A + y_B \cot \theta_B} = \mu_k^{\max}$$

$$\frac{-(840\text{m} - 950\text{m})}{950\text{m} \cot 27^\circ + 840\text{m} \cot 35^\circ} = \mu_k^{\max}$$

$$\boxed{\mu_k^{\max} = .036}$$