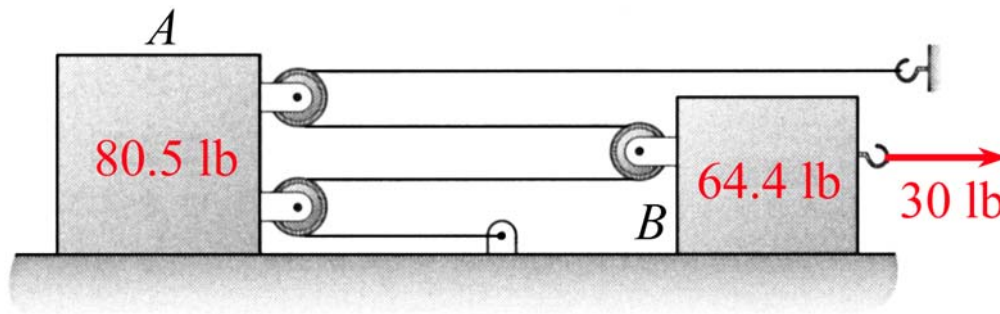


MEEG 2013 Quiz #3.m11.072

The blocks A and B shown are connected by a cable and pulleys and are moving to the right, where $\mu_k = 0.1$ between the support and the blocks. Using the *principle of virtual work in kinetics*, determine (a) the accelerations \mathbf{a}_A and \mathbf{a}_B of the blocks, (b) the tension F in the cable.



$FBD = EFD$ for entire system ③

$$\delta U: \quad 8.05(-0.5 \delta x_B) + (30 - 6.44)(\delta x_B) \quad ②$$

$$= 2.5(-0.5 a_B)(-0.5 \delta x_B) + 2 a_B(\delta x_B)$$

$$a_B = 7.44190 \quad a_A = -3.72095$$

$$\mathbf{a}_A = 3.72 \text{ ft/s}^2 \rightarrow \quad ① \quad \mathbf{a}_B = 7.44 \text{ ft/s}^2 \rightarrow \quad ①$$

$FBD = EFD$ for block B or A ②

$$F = 4.338 \quad F = 4.34 \text{ lb} \quad ①$$