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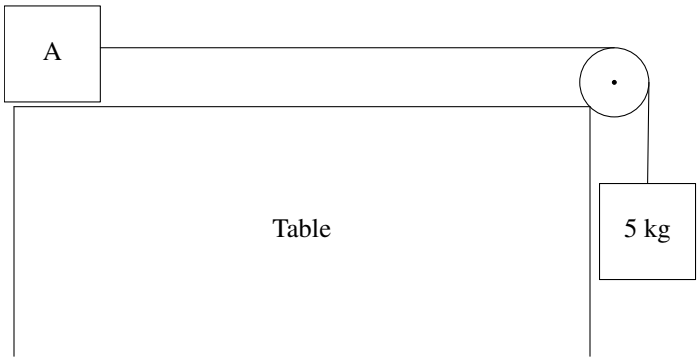

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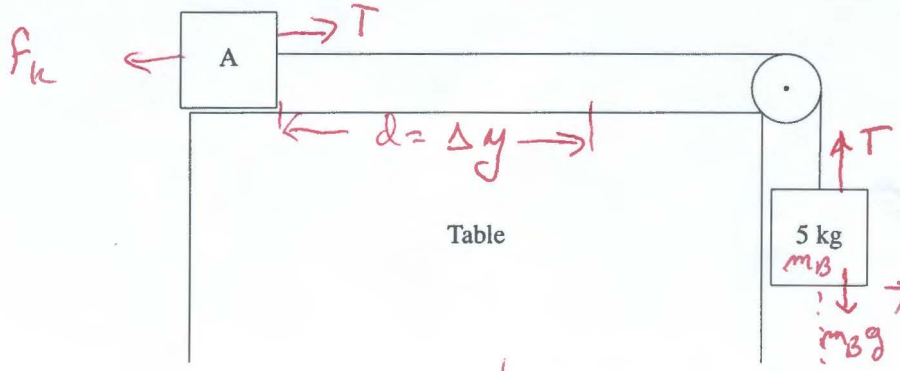

For forces, call ↓ positive

$y_{Bi} = 1.50$ m

$y_{Bf} = 0$ m

Using Energy

$E_i + W_{nc} = E_f$

$K_i + U_i - f_k d = K_f + U_f$

$+ m_B g y_{Bi} - \mu_K m_A g(\Delta y) = \frac{1}{2}(m_A + m_B) v_f^2 + m_B g y_{Bf}$

$m_B g (y_{Bi} - y_{Bf}) - \frac{1}{2} m_B v_f^2 = \frac{1}{2} m_A v_f^2 + \mu_K m_A g \Delta y$

$m_A = m_B \dfrac{\left[g(y_{Bi} - y_{Bf}) - \frac{1}{2} v_f^2\right]}{\frac{1}{2} v_f^2 + \mu_K g d}$

$m_A = \boxed{6.00 \text{ kg.}}$

Using Forces

$\sum \vec{F} = m\vec{a}$

1. find a: $v_f^2 = v_0^2 + 2a(\Delta y)$

Call down positive for block B

$(2.924)^2 = 2a(1.50) \Rightarrow$

$a = 2.85 \text{ m/s}^2$

2. Look at block B. call down positive

$m_B g - T = m_B a$

$T = m_B(g - a) = 34.75 \text{ N}$

3. Look at block A:

$T - f_k = m_A a$

$T - \mu_K m_A g = m_A a$

$m_A = \dfrac{T}{a + \mu_K g} = \boxed{6.00 \text{ kg}}$