(9) $I = 5 \times 10^{-3}\ kg\,m^2$

$\omega_0 = 0$ $\quad$ $\Delta KE = ?$

$\omega_f = 10^4 \frac{rev}{min}\left(\frac{2\pi\ rad}{1\ rev}\right)\left(\frac{1\ min}{60\ s}\right) = 1047.2 \frac{rad}{s}$

$\Delta KE = KE_f - KE_0 = \frac{1}{2}I\omega_f^2 - \frac{1}{2}I\omega_0^2 = \frac{1}{2}I\omega_f^2$

$\boxed{\Delta KE = 2.7\ kJ}$

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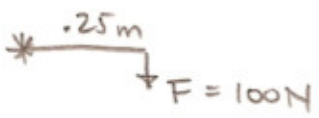
(10)



$\tau = F\ell = (100N)\left(\frac{1}{4}m\right) = 400\ N\,m$

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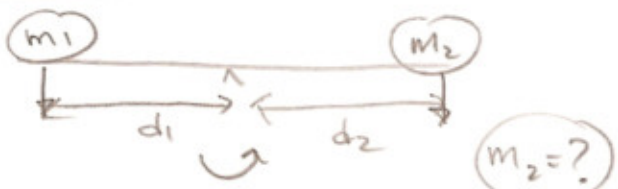
(11) $\sum \vec{\tau}_i = 0$

equilibrium



$m_1 = 22\ kg$

$d_1 = 2.0\ m$

$d_2 = 2.8\ m$

$+\tau_1 - \tau_2 = 0$

$m_1 g d_1 - m_2 g d_2 = 0 \Rightarrow m_2 = m_1 \frac{d_1}{d_2}$

$m_2 = (22\ kg)\left(\frac{2.0\ m}{2.8\ m}\right) = \boxed{15.7\ kg}$

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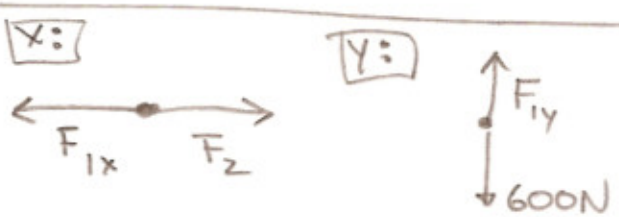
(12) $\sum \vec{F}_i = 0$

equilibrium



Look at y:

$F_{1y} = F_1 \frac{\sqrt{2}}{2} = 600N$

$F_1 = 848N \approx 845N$

Then X: $F_{1x} = 848N \frac{\sqrt{2}}{2} = F_2 = 600N$

None listed