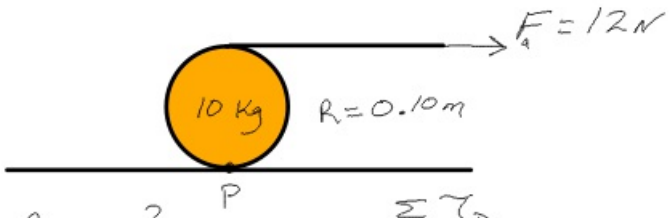
**71**




$a_{com} = ?$

$\alpha = ?$

$F_f = ?$

$$\alpha_P = \frac{\Sigma \tau_P}{I_P}$$

$$\alpha_P = \frac{\vec{r} \times \vec{F}_a}{I_{com} + Mh^2}$$

$$\alpha_P = \frac{(2R)(F_A)\sin 90^\circ}{\frac{1}{2}MR^2 + MR^2}$$

$$\alpha_P = \frac{2F_A}{1.5MR} = \frac{2(12)}{1.5(10)(0.1)}$$

$$\alpha_{com} = \alpha_P = 16\ rad/s^2$$

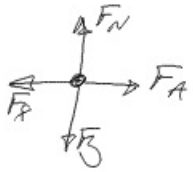
$$a = \alpha r = (16)(0.1)$$

$$a = 1.6 m/s^2$$

c) $F_f = ?$

$$a = \frac{\Sigma F}{m}$$

$$a = \frac{F_A - F_f}{m}$$




$$1.6 = \frac{12 - F_f}{10}$$

$$16 = 12 - F_f$$

$$4 = -F_f$$

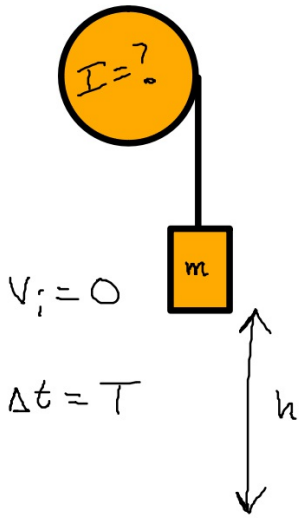
$F_f$ must be the other way

$$F_f = 4N\,\hat{i}$$

# Extra Lab

$I = ?$

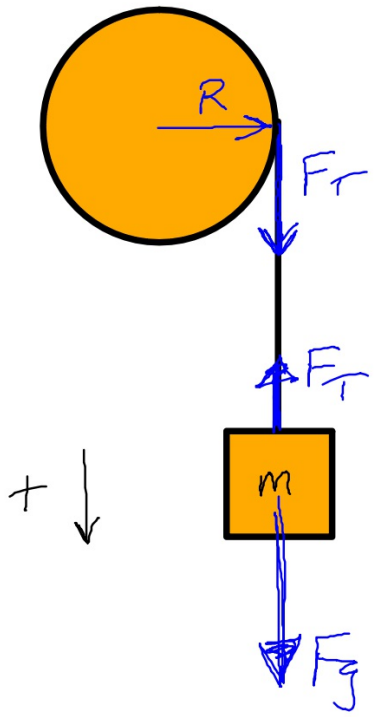
$U + K + W = U + K$




$mgh = \frac{1}{2} m v_f^2 + \frac{1}{2} I \omega_f^2$

$\Delta y = \frac{1}{2}(v_i + v_f) t$

$v_f = \omega_f r \qquad \omega = \frac{v}{r}$




$$\alpha = \frac{\vec{r} \times F_T}{I} \qquad \frac{a}{r} = \frac{rF_T}{I}$$

$$a = \alpha r \qquad a = \frac{r^2 F_T}{I}$$

$$a = \frac{F_g - F_T}{m}$$

$$\Delta y = v_i t + \tfrac{1}{2} a t^2$$