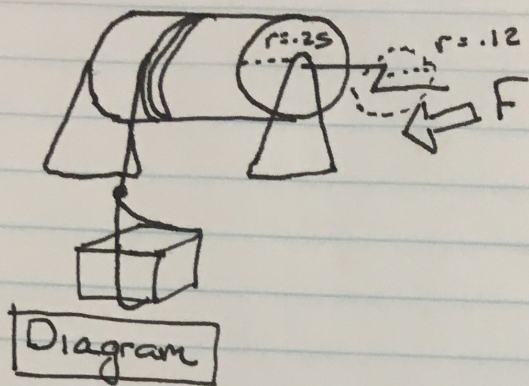


Problem 61



Given $m = 50 \text{ kg}$
 $r_1 = .25$ $r_2 = .12$
 $a = .80$ $I = 2.9$

Find F of Crank

$$\Sigma \tau = I \alpha \longrightarrow |\tau| = F \ell$$

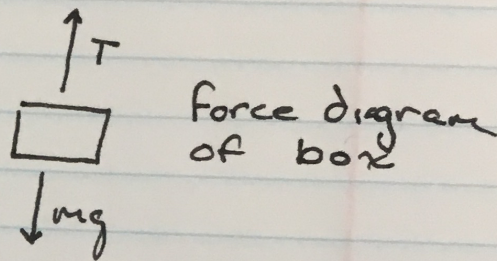
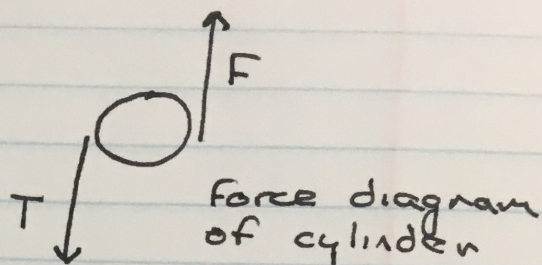
$\longrightarrow$ the object moves up so F is (+) and T is (-)

$$F r_2 - T r_1 = I \frac{a}{r_1}$$

$$F(.12) - 540(.25) = 2.9 \left(\frac{.8}{.25} \right)$$

$$F(.12) = 144.28$$

$$F = 1202.33 \text{ N}$$



$$\begin{aligned} T - mg &= ma \\ T &= mg + ma \\ T &= 500 + 40 \\ &= 540 \end{aligned}$$

(substitute for tension)

$\longrightarrow$ make sure to use the 2 different radii correctly

$\longrightarrow$ Although the crank arm turns circularly the force on the cylinder/box is upward because it moves the box upward