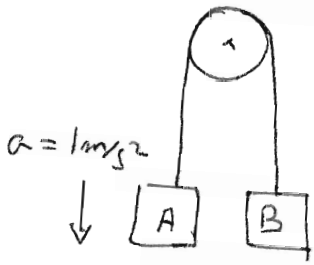
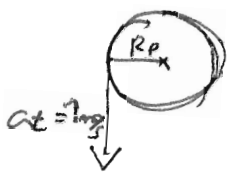


$\begin{cases} R_p = 0'5\,m \\ m_p = 0'5\,kg \end{cases}$

$a = 1\,m/s^2$

$m_A = 3\,kg$ $\quad m_B\,?$

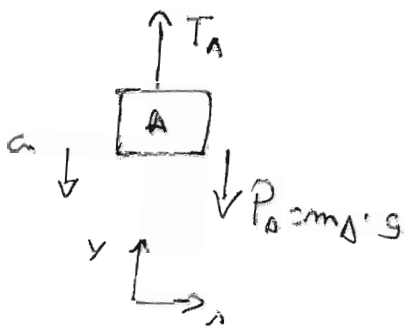
a) $\alpha\,?$



$a_t = \alpha \cdot R$

$$\alpha = \frac{a_t}{R} \qquad \alpha = \frac{1}{0'5} = 2\,rad/s^2$$

b) $T_A\,?$



$\sum F_y = m \cdot a_y$

$T_A - m_A \cdot g = -m_A \cdot a$

$T_A = m_A \cdot g - m_A \cdot a$

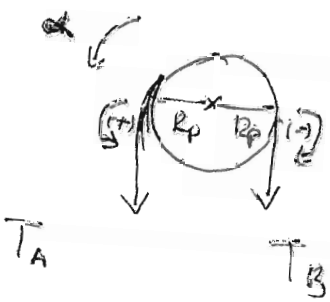
$$T_A = m_A (g - a)$$

$T_A = 3(9'81 - 1)$

$T_A = 26'43\,N$

c) $T_B\,?$

En la polea:



$\sum M = I \cdot \alpha$ $\quad \rightarrow I = \frac{1}{2} m_p \cdot R_p^2$

$T_A \cdot R_p - T_B \cdot R_p = I \cdot \alpha$

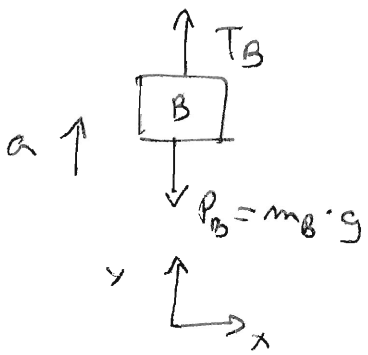
$T_A \cdot R_p - T_B \cdot R_p = \frac{1}{2} m_p R_p^2 \cdot \alpha$

$$T_B = T_A - \frac{1}{2} m_p R_p \alpha$$

$T_B = 26'43 - \frac{1}{2} \cdot 0'5 \cdot 0'5 \cdot 2$

$T_B = 26'18\,N$

d) m_b?



$$\Sigma F_b = m \cdot a_y$$

$$T_B - m_B \cdot g = m_B \cdot a$$

$$T_B = m_B \cdot g + m_B \cdot a$$

$$m_B = \frac{T_B}{(g+a)}$$

$$m_B = \frac{26'18}{(9'81+1)} = 2'42 \text{ Kg}$$