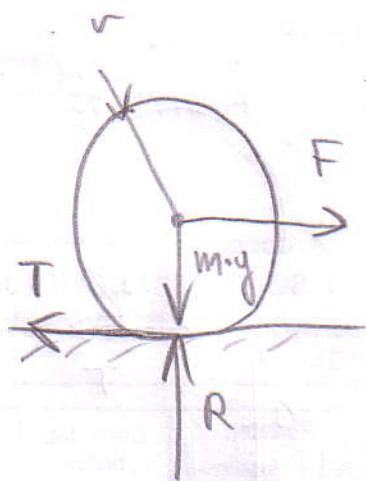




$$F = 500 \text{ [N]}$$

$$v_0 = 0 \left[\frac{\text{m}}{\text{s}} \right]$$

$$m = 10 \text{ [kg]}$$

$$r = 1 \text{ [m]}$$

$$I = \frac{1}{2} \cdot m \cdot r^2$$

$$\mu_k = 0,1 \text{ [-]}$$

$$g = 9,81 \left[\frac{\text{m}}{\text{s}^2} \right]$$

$$v = ? \Rightarrow s = 2\pi \cdot r$$

$$m \cdot a = F - T$$

$$T = \mu_k R = \mu_k m \cdot g = 0,1 \cdot 10 \cdot 9,81 = 9,81 \text{ [N]}$$

$$a = \frac{F - T}{m} = \frac{500 - 9,81}{10} \approx 49 \left[\frac{\text{m}}{\text{s}^2} \right]$$

$$s = v_0 t + \frac{a t^2}{2} \rightarrow v_0 = 0 \rightarrow s = \frac{a t^2}{2}$$

$$t = \sqrt{\frac{2 \cdot s}{a}} = \sqrt{\frac{2 \cdot 2 \cdot \pi \cdot r}{49}} \approx 0,51 \text{ [s]}$$

$$v = v_0 + a \cdot t \rightarrow v_0 = 0 \rightarrow v = a \cdot t$$

$$v = 49 \cdot 0,51 = 24,99 \left[\frac{\text{m}}{\text{s}} \right]$$

$$v = 24,99 \cdot 3,6 \left[\frac{\text{km}}{\text{h}} \right] = 89,9 \left[\frac{\text{km}}{\text{h}} \right]$$