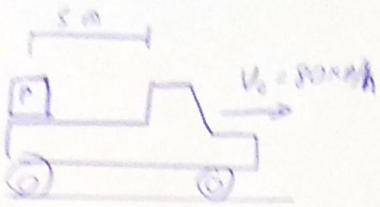
EXAMEN FINAL FI

H1

1.1



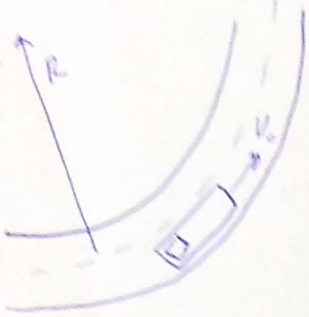
DATOS

$P = 100 \text{ kg}$

$\mu_s = 0.6$

$\mu_k = 0.4$

$V_0 = 80 \text{ km/h} = 22.22 \text{ m/s}$



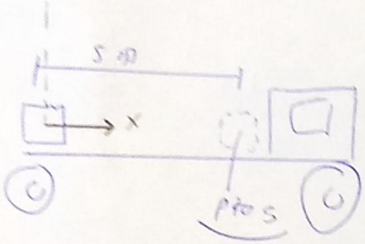
$$\Sigma F_r = m a_c$$

$$\mu_s \cdot N = m \frac{V_0^2}{R}$$

$$\mu_s \cdot m g = m \frac{V_0^2}{R} \Rightarrow R = \frac{V_0^2}{\mu_s g} = \frac{(22.22 \text{ m/s})^2}{0.6 \cdot 9.8 \text{ m/s}^2}$$

$$\boxed{R = 84 \text{ m}}$$

1.2



$$F_f = \mu_k N = 0.4 \cdot 100 \text{kg} \cdot 9.8 \text{ m/s}^2 = 490 \text{ N}$$

$$a_{bloque} = a_b = \frac{F_f}{m} = \frac{490 \text{ N}}{100 \text{ kg}} = 4.9 \text{ m/s}^2$$

escribo X_b y X_s

$$X_b(t) = 0 + V_0 t - \frac{1}{2} a_b t^2$$

$$X_s(t) = X_{camión} + V_0 t - \frac{1}{2} a_c t^2 \quad \leftarrow a_{camión}$$

igualo $X_b(t') = X_s(t')$

$$V_0 t' - \frac{1}{2} a_b t'^2 = X_{camión} + V_0 t' - \frac{1}{2} a_c t'^2$$

$$\boxed{a_c = \frac{2 X_{camión}}{t'^2} + a_b = \frac{2 \cdot 5 \text{ m}}{(2 \text{ s})^2} + 4.9 \text{ m/s}^2 = 7 \text{ m/s}^2}$$