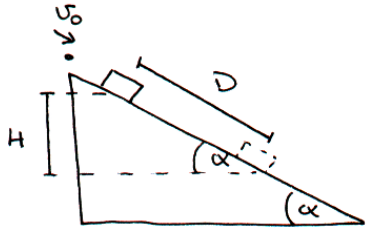
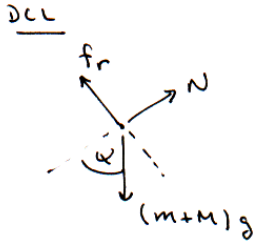
SOLUCIÓN EJERCICIO 12





$H = D \operatorname{sen}\alpha$

x) $(m+M)g\sin\alpha - f_r = (m+M)a$

y) $N - (m+M)g\cos\alpha = 0$

$\Rightarrow$ $f_r = \mu N = \mu(m+M)g\cos\alpha$

CHOQUE COMPLETAMENTE INELÁSTICO

$\Rightarrow$ $P_i = P_f$ $\Rightarrow$ $m v_0 = (m+M) v$

$$v = \frac{m}{m+M} v_0$$

DESPUÉS DEL CHOQUE APLICAMOS $\Delta E = W_{roce}$

$$E_i = (m+M)gH + \frac{1}{2}(m+M)v^2 = (m+M)gD\sin\alpha + \frac{1}{2}\frac{m^2}{m+M}v_0^2$$

$$E_f = 0$$

$$W_{roce} = -f_r \cdot D = -\mu(m+M)g\cos\alpha D$$

ENTONCES

$$\Delta E = W_{roce} \Rightarrow 0 - \left[(m+M)gD\sin\alpha + \frac{1}{2}\frac{m^2}{m+M}v_0^2\right] = -\mu(m+M)g\cos\alpha D$$

$$\frac{1}{2}\frac{m^2}{m+M}v_0^2 = (m+M)g\left[\mu\cos\alpha - \operatorname{sen}\alpha\right]D$$

$$\boxed{D = \frac{1}{2}\left(\frac{m}{m+M}\right)^2 \frac{v_0^2}{g(\mu\cos\alpha - \operatorname{sen}\alpha)}}$$