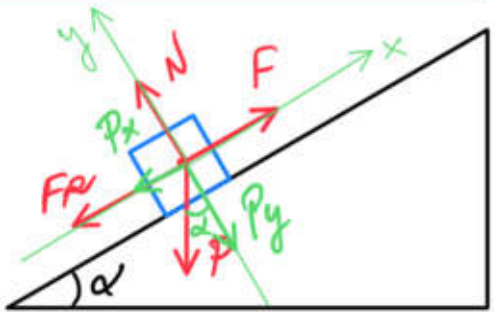
EJERCICIO FQ1BE2803:



$\alpha = 30°$
$m = 2\,Kg$
$\mu = 0{,}15$
$F = 25\,N$

$P_x = mg \operatorname{sen}\alpha = 9{,}8\,N$
$P_y = mg \cos\alpha = 16{,}97\,N$

a) Aceleración:

$\Sigma F_x = m \cdot a$

$F - P_x - F_R = m \cdot a$

$F - mg \operatorname{sen}\alpha - \mu \cdot N = m \cdot a$

$F - mg \operatorname{sen}\alpha - \mu \cdot mg \cos\alpha = m \cdot a$

$25 - 9{,}8 - 0{,}15 \cdot 16{,}97 = 2a$

$12{,}675 = 2a \Rightarrow \boxed{a = \frac{12{,}675}{2} = 6{,}33\,m/s^2}$

$\Sigma F_y = 0$

$N - P_y = 0$

$N = P_y = mg \cos\alpha$

$N = 16{,}97\,N$

b) Espacio en 3 segundos:

MRUA: $S = \cancel{S_0} + \cancel{V_0}^{\,0} t + \frac{1}{2} a t^2 =$

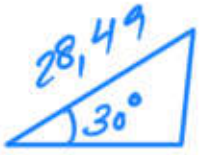
$S = \frac{1}{2} 6{,}33 \cdot 3^2 = 28{,}49\,m$

c) Velocidad a los 3 segundos:

MRUA: $V = \cancel{V_0}^{\,0} + at$

$V = 6{,}33 \cdot 3 = 18{,}99\,m/s$

d) Altura a los 3 segundos:



$\operatorname{sen} 30 = \frac{h}{28{,}49}$

$\boxed{h = 28{,}49 \cdot \operatorname{sen} 30 = 14{,}25\,m}$

e) Trabajo de la F_R:

$\sin 30 = \frac{5}{d} \Rightarrow d = \frac{5}{\sin 30} = 10\,m$

$W_{FR} = F_R \cdot d \cdot \cos 180 = -\mu \cdot N \cdot 10 =$

$= -0,15 \cdot 16,97 \cdot 10$

$\boxed{W_{FR} = -25,46\ J}$