Problemas

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Abstract

Abstract content goes here

Problema 1:

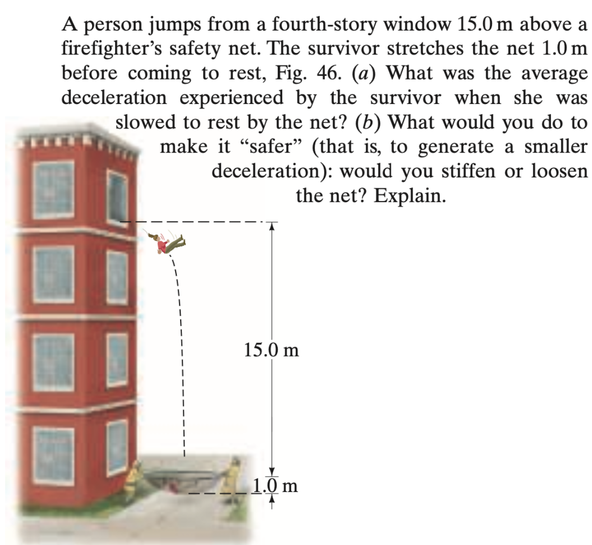

Figure 1: PROBLEMA 1

Principalmente pondremos las variables que tenemos en nuestro problema

Vo=0

Y=0

Yo=15m

Ecuaciòn

$V^2 = V_o^2 - 2g\,(y - y_o)$

Con las variables que ya tenemos, ahora vamos a sustituir en la formula

$V^2 = 0 - 2\left(9.8\ \frac{m}{s^2}\right)(0 - 15m)$

$V = \sqrt{2\left(9.8\ \frac{m}{s^2}\right)(15m)} = 17.15\ \frac{m}{s}$

Calculamos la aceleración promedio

despejamos la aceleración

$V^2 = V_o^2 - 2a\,(y - y_o)$

$a = \frac{V^2 - V_o^2}{2(y - y_o)}$

y las variables que tenemos son:

$V_o = 17.15\ \frac{m}{s}$

V=0

Yo= 1m

Y=0

Sustituimos

$a = \frac{(0)^2 - \left(17.15\ \frac{m}{s}\right)^2}{2(0-1m)} = \frac{\left(-17.15\ \frac{m}{s}\right)^2}{2(-1m)} = 147.06\ \frac{m}{s^2}$

Y ese resultado es la desaceleración.

Problema 2:

A person driving her car at 45 km/h approaches an intersection just as the traffic light turns yellow. She knows that the yellow light lasts only 2.0 s before turning to red, and she is 28 m away from the near side of the intersection (Fig. 51). Should she try to stop, or should she speed up to cross the intersection before the light turns red? The intersection is 15 m wide. Her car's maximum deceleration is $-5.8\,\mathrm{m/s^2}$, whereas it can accelerate from 45 km/h to 65 km/h in 6.0 s. Ignore the length of her car and her reaction time.

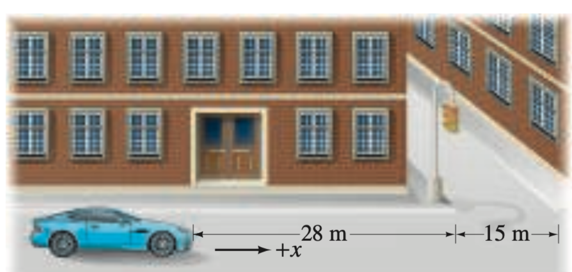

Figure 2: This is a caption

En este problema las variables que tenemos son:

$a = 5.8\ \frac{m}{s^2}$

$V^2 = 0$

$V_o = 12.5\ \frac{m}{s}$

Usaremos la ecuación

$V^2 = V_o^2 - 2a\,(x - x_o)$

Y despejaremos para poder obtener el desplazamiento

y poder saber si el carro lograra detenerse

$x - x_o = \frac{\left(V^2 - V_o^2\right)}{2a} = \frac{\left(0^2 - \left(12.5\ \frac{m}{s}\right)^2\right)}{2\left(-5.8\ \frac{m}{s^2}\right)} = 13.46m$

Como la distancia de frenado es menor que la del auto, ella tiene que detern el auto.

Problema 3:

(II) Extreme-sports enthusiasts have been known to jump off the top of El Capitan, a sheer granite cliff of height 910 m in Yosemite National Park. Assume a jumper runs horizontally off the top of El Capitan with speed 5.0 m/s and enjoys a freefall until she is 150 m above the valley floor, at which time she opens her parachute (Fig. 41). (*a*) How long is the jumper in freefall? Ignore air resistance. (*b*) It is important to be as far away from the cliff as possible before opening the parachute. How far from the cliff is this jumper when she opens her chute?

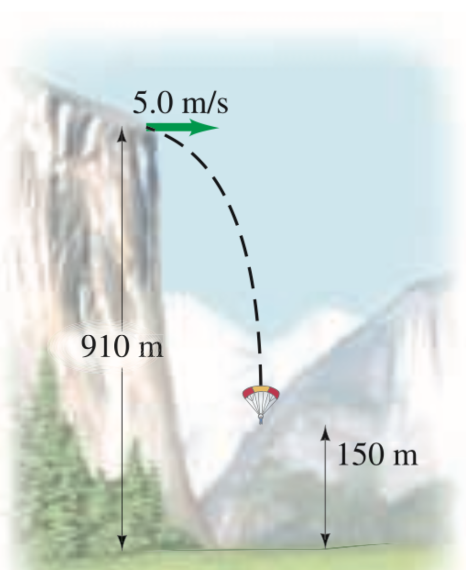

Figure 3: This is a caption

a) y=0 hacia arriba como direccion positiva.

$y = 150\ m$

$y_o = 910\ m$

$V_o = 0$

La ecuación que usaremos:

$y = y_o + V_o y t - \frac{1}{2} g t^2$

Para despejar el tiempo

$150\ m = 910m - \frac{1}{2} g t^2$

$\frac{1}{2} g t^2 = 910m - 150m = 720m$

$t^2 = \frac{2(760m)}{9.81\ \frac{m}{s^2}}$

$t = \sqrt{\frac{2(760\ m)}{9.81\ \frac{m}{s^2}}} = 12.44\ s$

La caída libre dura 12.44s.

b)el movimiento esta a una velocidad constante

$V_{x_o} = 5\ \frac{m}{s}$

$t = 12.44\ s$

Ecuación

$x = V_{x_o} t = 5\ \frac{m}{s} \cdot 12.44\ s = 62.2m$

La distancia eran de 62.2m cuando lo abrió ya que se ignora la resistencia del aire.