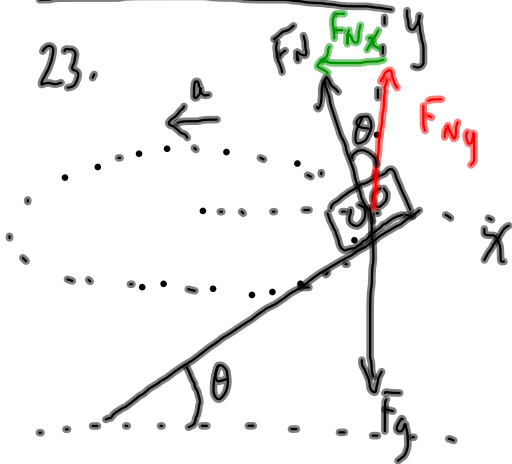


From HW (PP 566)

23.



$$r = 155\text{m}$$

$$v = 85\text{ km/h} = 23.6\text{ m/s}$$

$$\vec{F}_{\text{net}} = m\vec{a}$$

$$F_{N_x} = \frac{mv^2}{r}$$

$$\cancel{mg} \tan\theta = \cancel{mv^2}$$

$$\tan\theta = \frac{v^2}{gr}$$

$$\tan\theta = \frac{(23.6\text{ m/s})^2}{(9.81\text{ m/s}^2)(155\text{ m})}$$

$$\tan\theta = 0.367$$

$$\theta = 20^\circ$$

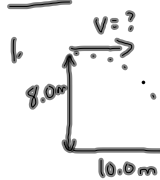
$$\tan\theta = \frac{F_{N_x}}{F_{N_y}}$$

$$F_{N_x} = F_{N_y} \tan\theta$$

$$F_{N_x} = F_g \tan\theta$$


$$F_{N_x} = mg \tan\theta$$

Quiz

1.  $v = ?$
 9.0m
 10.0m

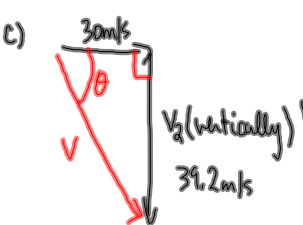
Vertically $\Delta d = v_i t + \frac{1}{2} a t^2$
 $\Delta d = \frac{1}{2} a t^2$
 $t = 1.28_s$

Horizontally $v = \frac{\Delta d}{\Delta t}$
 $v = \frac{10.0m}{1.28s}$

2.  $30m/s$
 4.0s


a) vertically $\Delta d = v_i t + \frac{1}{2} a t^2$
 $\Delta d = -78m$
 displacement not height. $h = 78m$

b) horizontally:
 $v = \frac{\Delta d}{\Delta t}$
 $\Delta d = v \Delta t$
 $\Delta d = (30m/s)(4.0s) = 120m$

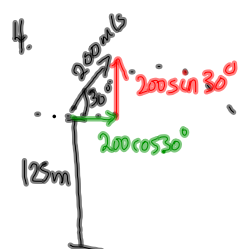
c)  $30m/s$
 θ
 v_2 (vertically)
 39.2m/s

$a = \frac{\Delta v}{\Delta t}$
 $a = \frac{v_2 - v_1}{\Delta t}$
 $v_2 = v_1 + a \Delta t$
 $v_2 = (-9.81m/s^2)(4.0s)$
 $v_2 = -39.2m/s$

49m/s [53° below the horizontal]

3.  $9.0m/s$
 20.0°

use maybe useful projectile eq
 a) 0.56s
 b) 4.2m

4.  $200m/s$
 30°
 $125m$
 $200 \sin 30^\circ$
 $200 \cos 30^\circ$

vertically:
 $\Delta d = v_i t + \frac{1}{2} a t^2$
 $-125 = (200 \sin 30^\circ)t - \frac{9}{2} t^2$
 $t = 21.6s$

horizontally:
 $200 \cos 30^\circ \cdot v = \frac{\Delta d}{\Delta t} \cdot 21.6s$
 $\Delta d = 3.74 \times 10^3 m$