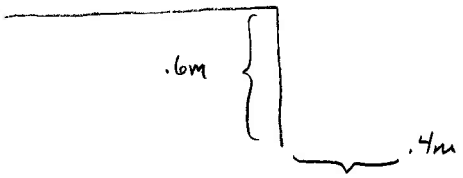
Ch. 6 Set 2
p.150 2,3
p.152 4,7,10
p.164 34,43,53,56,57

(2)



The giraffe must go .4m in the time it takes to fall .6m

$\Delta d_y = -.6m$
$V_{iy} = 0 m/s$
$g = -9.80 m/s^2$
Δt

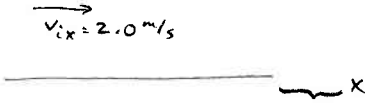
$\Delta d_y = V_{iy}\Delta t + \frac{1}{2}g\Delta t^2 \quad V_{iy} = 0$

$\Delta t = \sqrt{\frac{2\Delta d_y}{g}}$

$= \sqrt{\frac{2(-.6)}{(-9.80)}} = .4s$

$V_x = \frac{\Delta d_x}{\Delta t} = \frac{.4m}{.4s} = 1 m/s$

(3)



$V_{ix} = 2.0 m/s$
$\Delta d_x = .07m$

$\Delta t = \frac{\Delta d_x}{V_{ix}} = \frac{.07m}{2.0 m/s} = .035s$

Δd_y
$V_{iy} = 0 m/s$
$g = -9.80 m/s^2$
$\Delta t = .035s$

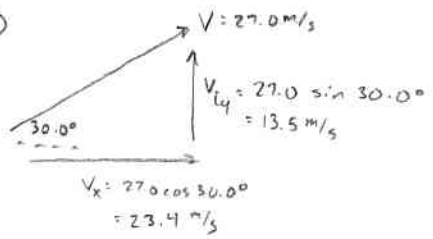
$\Delta d_y = V_{iy}\Delta t + \frac{1}{2}g\Delta t^2$

$\Delta d_y = \frac{1}{2}(-9.80)(.035)^2$

$= .0060m$

$= .60cm$

(4.)



c) The total time in the air is when $\Delta d_y = 0$

$\Delta d_y = 0$
$\Delta t =$
$V_{iy} = 13.5 m/s$
$g = -9.80 m/s^2$

$\Delta d_y = V_{iy}\Delta t + \frac{1}{2}g\Delta t^2$

$-13.5\Delta t = \frac{1}{2}g\Delta t^2$

$\Delta t = 2.76s$

b) max height is when $V_{fy} = 0 m/s$

$\Delta d = \frac{V_f^2 - V_i^2}{2g}$

$= \frac{0 - (13.5)^2}{2(-9.80)}$

$= 9.30m$

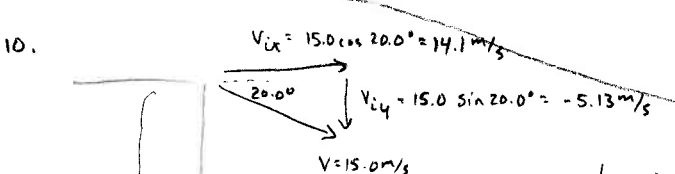
c) $\Delta d_x = V_x \Delta t$

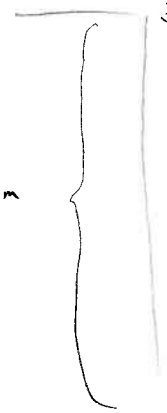
$= (23.4)(2.76)$

$= 64.6m$

7. on your own

10.





time to hit the ground

$V_{iy} = -5.13 m/s$
$g = -9.80 m/s^2$
$\Delta d_y = -28m$

find V_{fy}

$V_{fy}^2 = V_{iy}^2 + 2g\Delta d$

$= (-5.13)^2 + 2(-9.80)(-28)$

$= -24.0 m/s$

$V_{fy} = V_{iy} + g\Delta t$

$\Delta t = \frac{V_{fy} - V_{iy}}{g} = \frac{-24.0 + 5.13}{-9.80} = 1.93s$

$\Delta d_x = V_x \Delta t$

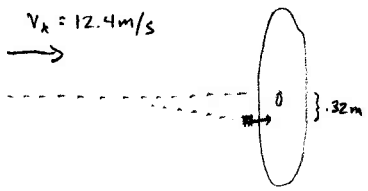
$= (14.1)(1.93)$

$= 27.2m$

(34.) on your own

(43.) on your own

(53.)



How long to fall .32 m

$V_{iy} = 0 m/s$

$g = -9.80 m/s^2$

$\Delta d_y = -.32 m$

$\Delta d_y = V_{iy}\Delta t + \frac{1}{2} g \Delta t^2$

$\Delta t = \sqrt{\frac{2\Delta d_y}{g}}$

$= \sqrt{\frac{2(-.32)}{-9.80}}$

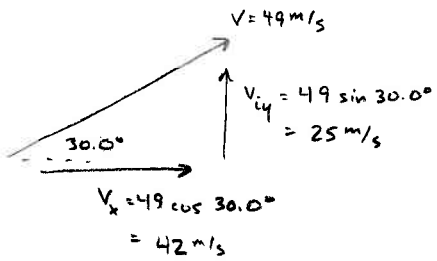
$= .25 s$

$\Delta d_x = V_x \Delta t$

$= (12.4)(.25)$

$= 3.1 m$

(56.)



a) At max height

$V_{fy} = 0 m/s$

$V_{iy} = 25 m/s$

$V_{fy} = 0 m/s$

$g = -9.80 m/s^2$

$\Delta d = \frac{V_{fy}^2 - V_{iy}^2}{2g}$

$\frac{0^2 - (25)^2}{2(-9.80)}$

$= 32 m$

b) When hits target

$\Delta d_y = 0$. Find Δt

$\Delta d_y = V_{iy}\Delta t + \frac{1}{2} g \Delta t^2$

$-V_{iy}\Delta t = \frac{1}{2} g \Delta t^2$

Solve for Δt

$\Delta t = \frac{-2V_{iy}}{g}$

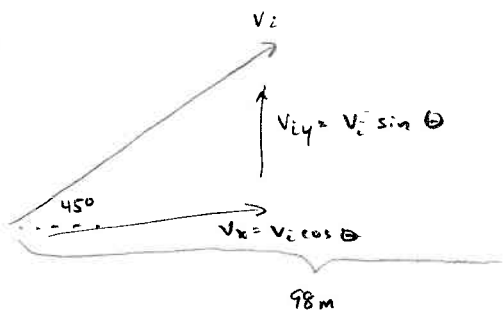
$= \frac{-2(25)}{-9.80} = 5.1 s$

$\Delta d_x = V_x \Delta t$

$\Delta d_x = (42)(5.1)$

$= 210 m$

(57.)



Don't worry about doing this one

$\Delta d_x = V_x \Delta t$

$\Delta d_x = (V_i \cos\theta)\Delta t$

$\Delta t = \frac{\Delta d_x}{V_i \cos\theta}$

$\Delta d_y = V_{iy}\Delta t + \frac{1}{2} g \Delta t^2$ $\Delta d_y = 0$

so,

$0 = \left(V_{iy} + \frac{1}{2} g \Delta t\right)\Delta t$

so, $\Delta t = 0$ or $\left(V_{iy} + \frac{1}{2} g \Delta t\right) = 0$

$V_i \sin\theta + \frac{1}{2} g \left(\frac{\Delta d_x}{V_i \cos\theta}\right) = 0$

solve for V_i

$V_i^2 = \frac{g \Delta d_x}{2 \sin\theta \cos\theta}$

$V_i = \sqrt{\frac{g \Delta d_x}{2 \sin\theta \cos\theta}}$ $31 m/s \; @ \; 45°$