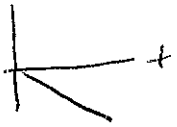
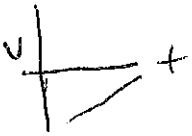
b) 

c) 

e) 

(2) a) 1st half of #1 and all of #3

b) 2nd half of #1

c) #2

(3) yes! the car would be slowing down

(4) $v_0 = 7\,m/s$

$a = 0.8\,m/s^2$

$t = 2\,s$

$v = ?$

$\boxed{v = v_0 + at}$

$v = 7\,m/s + (0.8\,m/s^2)2s$

$\boxed{v = 8.6\,m/s}$

(5) ~~$v_0 = 0\,m/s$~~

$v_0 = 33\,m/s$

$v = 0\,m/s$

$a = -11\,m/s^2$

$\Delta x = ?$

$\boxed{v^2 = v_0^2 + 2a\Delta x}$

$\Delta x = \frac{v^2 - v_0^2}{2a}$

$\Delta x = \frac{0^2 - 33^2}{2(11)}$

$\boxed{\Delta x = 49.5\,m}$

not enough distance for truck to stop

$a = 2.9\ m/s^2$

$V_f = 58\ m/s$

$t = ?$

$\Delta x = ?$

$t = \frac{V - V_0}{a}$

$t = \frac{58\ m/s - 0\ m/s}{2.9\ m/s^2}$

$t = 20s$

$\Delta x = \frac{V - V_0}{2a}$

$\Delta x = \frac{58^2 - 0^2}{2(2.9\ m/s^2)}$

$\Delta x = 580m$

(7) $V_0 = 0\ m/s$

$a = 9.81\ m/s^2$

$\Delta x = 427m$

$V = ?$

$V^2 = V_0^2 + 2a\Delta x$

$V^2 = 0 + 2(9.81\ m/s^2)(427m)$

$V^2 = 8369.2\ m/s$

$V = 91.5\ m/s$

(8) $V_0 = 16\ m/s$

$V = 32\ m/s$

$t = 10s$

a) $a = ?$

$V = V_0 + at$

$a = \frac{V - V_0}{t}$

$a = \frac{32 - 16}{10s}$

$a = 1.6\ m/s^2$

b) $V_{avg} = ?$

$V_{avg} = \frac{1}{2}(V_0 + V)$

$V_{avg} = \frac{1}{2}(16\ m/s + 32\ m/s)$

$V_{avg} = 24\ m/s$

c) $\Delta x = ?$

$\Delta x = V_0 t + \frac{1}{2} a t^2$

$\Delta x = (16\ m/s)(10s) + \frac{1}{2}(1.6\ m/s^2)(10s)^2$

$\Delta x = 160 + 80$

$\Delta x = 240m$

$V = 18\ m/s$

$t = 12s$

$\Delta x = ?$

$\Delta x = V_{avg}(\Delta t)$

$\Delta x = \frac{1}{2}(V_0 + V)t$

$\Delta x = \frac{1}{2}(0 + 18)\ 12s$

$\boxed{\Delta x = 108m}$

(10) $V_0 = 120\ m/s$

$a = -6\ m/s^2$

$V = 0\ m/s$

$t = ?$

a) $t = ?$

$\boxed{V = V_0 + at}$

$t = \frac{V - V_0}{a}$

$t = \frac{0 - 120\ m/s}{-6\ m/s^2}$

$\boxed{t = 20s}$

b) $\Delta x = ?$

$\boxed{V^2 = V_0^2 + 2a\Delta x}$

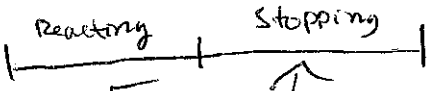
$\Delta x = \frac{V^2 - V_0^2}{2a}$

$\Delta x = \frac{(0^2 - 120^2\ m/s)}{2(-6\ m/s^2)}$

$\boxed{\Delta x = 1200m = 1.2km}$

Cannot Land

(11)



$V_R = 12\ m/s$

$t_R = 0.5s$

$\boxed{V_R = \frac{\Delta x_R}{t_R}}$

$\Delta x_R = V_R t_R$

$\Delta x_R = (12\ m/s)(0.5\ m/s)$

$\boxed{\Delta x_R = 6.12m}$

$V_0 = 12\ m/s$

$a = -6.2\ m/s^2$

$V_s = 0\ m/s$

$\Delta x_s = ?$

$\boxed{V^2 = V_0^2 + 2a\Delta x}$

$\Delta x = \frac{V^2 - V_0^2}{2a}$

$\Delta x = \frac{0^2 - 12^2\ m/s}{2(-6.2\ m/s^2)}$

$\Delta x = \frac{-144\ m/s}{-12.4\ m/s^2}$

$\boxed{\Delta x = 11.6m}$

$\Delta x_R + \Delta x_s = \Delta x\ total$

$6.12m + 11.6m = \boxed{17.7m = \Delta x_{total}}$

$t = 2.4\,s$

$a = 1.6\,m/s^2$

$V_0 = 0$

$V_0 = \frac{\Delta x - \frac{1}{2} a t^2}{t}$

$V_0 = \frac{20m - \frac{1}{2}(1.6\,m/s^2)(2.4\,s)^2}{2.4\,s}$

$V_0 = 6.4\,m/s$

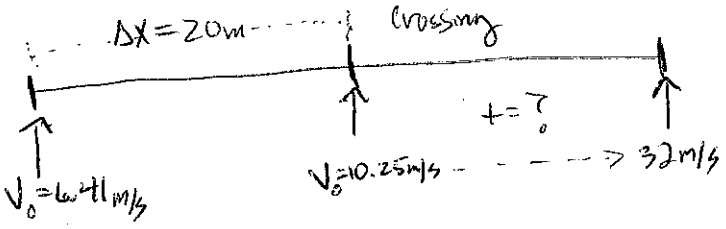
$a = \frac{\Delta V}{\Delta t}$

$a = \frac{V_f - V_0}{t}$

$V_f = V_0 + a t$

$V_f = 6.41\,m/s + (1.6\,m/s^2)(2.4\,s)$

$V_f = 10.25\,m/s$



$V = 32\,m/s$

$a = 1.6\,m/s^2$

$t = ?$

$V_0 = 10.25\,m/s$

$V = V_0 + a t$

$t = \frac{V - V_0}{a}$

$t = \frac{32\,m/s - 10.25\,m/s}{1.6\,m/s^2}$

$t = 13.6\,s$ from entering crossing to 32 m/s

$\vec{a} = g = 9.8 \text{ m/s}^2 \downarrow$

$\Delta x = 50 \text{ m} \downarrow$

$t = ?$

b) $\boxed{V^2 = V_0^2 + 2a\Delta x}$

$V^2 = (10 \text{ m/s})^2 + 2(9.8 \text{ m/s}^2)(50 \text{ m})$

$\boxed{V = 32.86 \text{ m/s down}}$

then

a) $\boxed{V = V_0 + at}$

$t = \dfrac{V - V_0}{a}$

$t = \dfrac{32.86 \text{ m/s} - 10 \text{ m/s}}{9.8 \text{ m/s}^2}$

$\boxed{t = 2.33 \text{ s}}$

Stone 1

(17) $\Delta x = 50 \text{ m} \downarrow$

$a = g = 9.8 \text{ m/s}^2 \downarrow$

$V_0 = 20.0 \text{ m/s}$

a) $t = ?$

$\boxed{V^2 = V_0^2 + 2a\Delta x}$

$V^2 = 2 \text{ m/s} + 2(-9.8 \text{ m/s}^2)(-50 \text{ m})$

$\boxed{V_0 = 31.4 \text{ m/s} \downarrow}$

$\boxed{V = V_0 + at}$

$t = \dfrac{V - V_0}{a}$

$t = \dfrac{-31.4 \text{ m/s} - 2 \text{ m/s}}{-9.8 \text{ m/s}^2}$

$\boxed{t_1 = 3.41 \text{ s}}$

Stone 2

$\Delta x = 50 \text{ m} \downarrow$

$a = g = 9.8 \text{ m/s}^2 \downarrow$

$t_2 = t_1 - 1 \text{ s}$

$t_2 = 3.4 \text{ s} - 1 \text{ s}$

$\boxed{t_2 = 2.4 \text{ s}}$

b) $V_0 = ?$

$\Delta x = V_0 t + \frac{1}{2} a t^2$

$V_0 = \dfrac{\Delta x - \frac{1}{2} a t^2}{t}$

$V_0 = \dfrac{-50 \text{ m} + \frac{1}{2}(-9.8 \text{ m/s}^2)(2.41 \text{ s})^2}{}$

$\boxed{V_0 = -7.94 \text{ m/s}}$

c) $\boxed{V_{\text{stone 1}} = 31.4 \text{ m/s down}}$

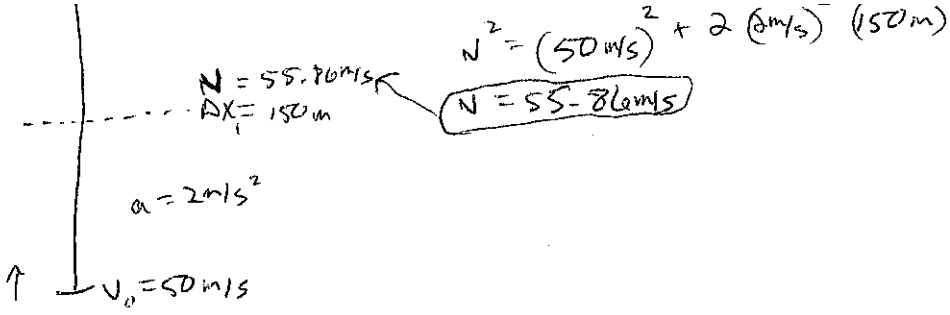
$V_2 = V_{02} + at$

$V_2 = -8.94 \text{ m/s} + (-9.8 \text{ m/s}^2)(2.41 \text{ s})$

$\boxed{V_2 = -32.6 \text{ m/s down}}$

$a = 2\ m/s^2$

$\Delta x_1 = 150\ m$



$N^2 = (50\ m/s)^2 + 2(2\ m/s^2)(150\ m)$

$N = 55.86\ m/s$

a) $N^2 = V_0^2 + 2a\Delta x$

$\Delta x = \dfrac{N^2 - V_0^2}{2a}$

$\Delta x = \dfrac{0 - (55.68\ m/s)^2}{2(-9.8\ m/s^2)} = \dfrac{3100}{19.6}$

~~$\Delta x = 2.84$~~

$\Delta x_2 = 158\ m$

$\Delta x_{total} = \Delta x_1 + \Delta x_2$

$= 150\ m + 158\ m$

$= 308\ m$

b) $V_f = V_{i0} + a_1 t_1$

$55.68 = 50 + 2(t)$

$t_1 = 2.84\ s$

$V_2 = V_{20} + a_2 t_2$

$0 = 55.68 + (-9.8)\, t_2$

$t_2 = 5.68\ s$

$t_{total} = 2.84\ s + 5.68\ s$

$= 8.52\ s$

c) $\Delta x = 308\ m \downarrow$

$a = 9.8\ m/s^2 \downarrow$

$V_0 = 0$

$t = ?$

$\Delta x = V_0 t + \frac{1}{2} a t^2$

$308\ m = 0 + \frac{1}{2}(-9.8)\, t^2$

$t = 7.93\ s$ down

$t_{tot} = 16.45\ s$

$V^2 = V_0^2 + 2a\Delta x$

$a = -0.31 m/s^2$ $\quad V^2 = (1.2 m/s)^2 + 2(-0.31 m/s^2)(0.75m)$

$\Delta x = 0.75m$ $\quad V^2 = 1.44 - (0.47)$

$V = ?$ $\quad \boxed{V = 0.98 m/s}$

(14) a) decreases on way up & increases on way down

b) $V = 0 m/s$ at peak

c) $\vec{a} = 9.8 m/s^2$ downward

d) $\vec{a} = 9.8 m/s^2$ downward

e) remains constant

(15) $V_0 = 0.5 m/s$

$a = g = 9.8 m/s^2 \downarrow$

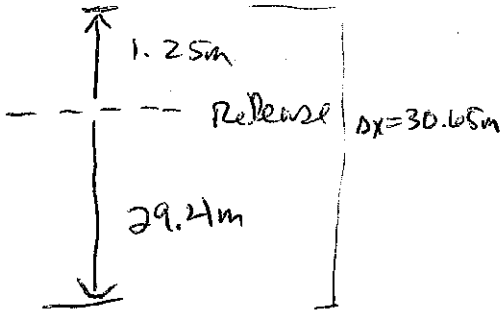
$t = 2.5s$

$V = ?$

a) $V = V_0 + at$

$V = 0.5 m/s + (-9.8 m/s^2)(2.5s)$

$\boxed{V = -24 m/s}$



b) —Fish—

$\Delta x = V_0 t + \frac{1}{2} a t^2$

$\Delta x = (0.5 m/s)(2.5s) + \frac{1}{2}(-9.8 m/s^2)(2.5s)^2$

$\Delta x = 1.25m + (-30.1m)$

$\boxed{\Delta x_F = 29.4m \text{ down}}$

—Pelican—

$V = \frac{\Delta x}{t}$

$\Delta x = V(t)$

$\Delta x = (0.5 m/s)(2.5s)$

$\boxed{\Delta x_P = 1.25m \text{ up}}$

$\Delta x_F + \Delta x_P = \Delta x_{total}$

$29.4m + 1.25m = \boxed{30.65m}$