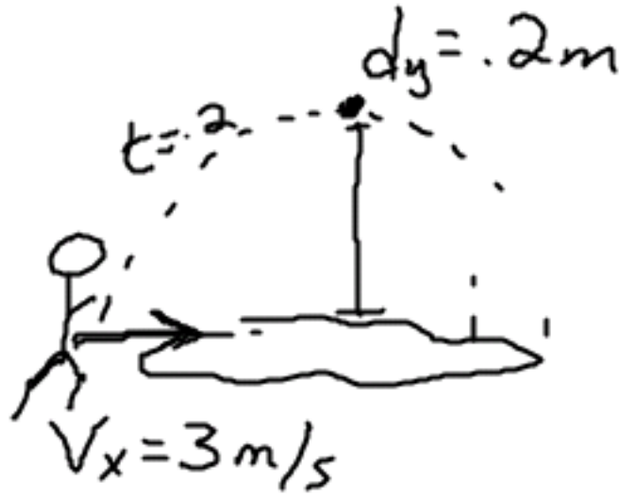
8.



$t_{total} = .2 \times 2 = .45$

1 ——— 1.5m

$d_x = V_x t$

$d_x = (3)(.4) = 1.2m$

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

$-10 = \frac{0 - 2}{t}$

$t = .2s$

Vertical

$d_{y_i} = 0$

$d_{y_f} = .2m$

$a = -10 m/s^2$

$V_{y_i} = ?\ 2 m/s$

$V_{y_f} = 0$

$t = ?$

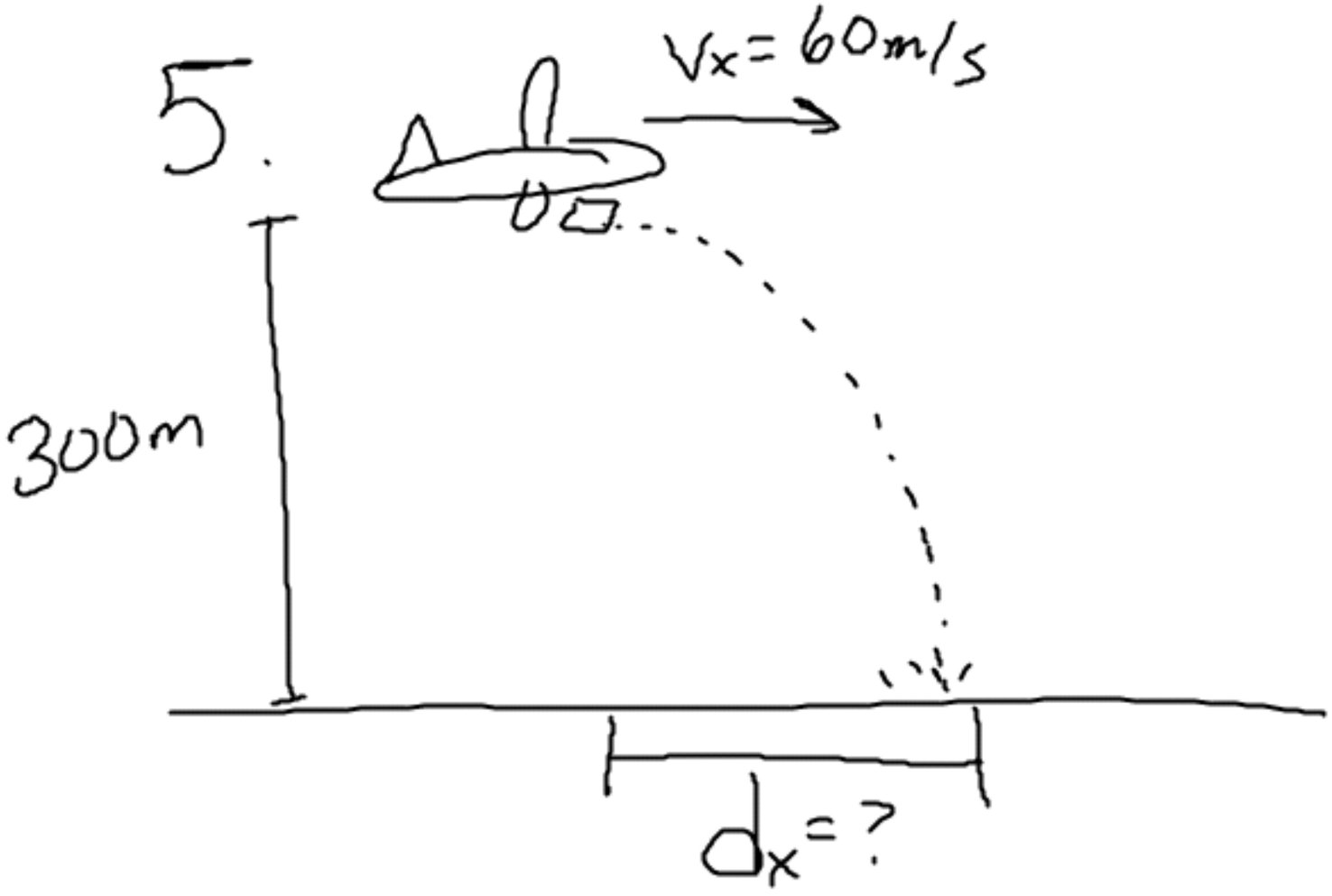
$V_f^2 = V_i^2 + 2ad$

$0 = V_i^2 + 2(-10)(.2)$

$0 = V_i^2 + -4$

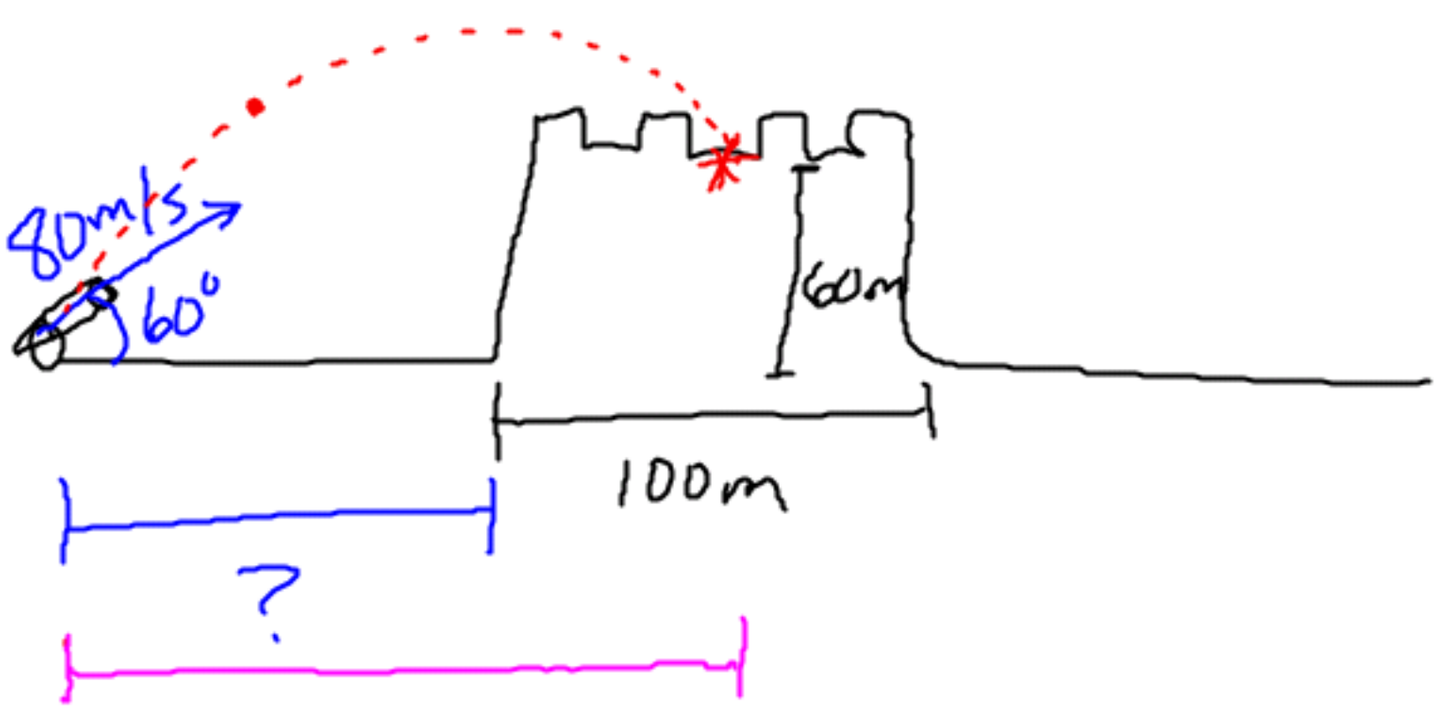
$V_i = \sqrt{4} = 2 m/s$

5.



$$V_x = \frac{dx}{t}$$

$$d_x = V_x t$$



d_x

$V_x = (\cos 60)80$

$V_x = 40 m/s$

$d_x = V_x t = 517.2m$

-50

$= 467.2m$ from wall

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$t = 12.93s$ & $.9s$

Vertical

$V_i = (\sin 60)(80) = 69.3 m/s$

$V_f =$

$d_i = 0$

$d_f = 60m$

$a = -10 m/s^2$

$t =$

$$d_f = \frac{1}{2}at^2 + V_i t + d_i$$

$$60 = \frac{1}{2}(-10)t^2 + 69.3t + 0$$

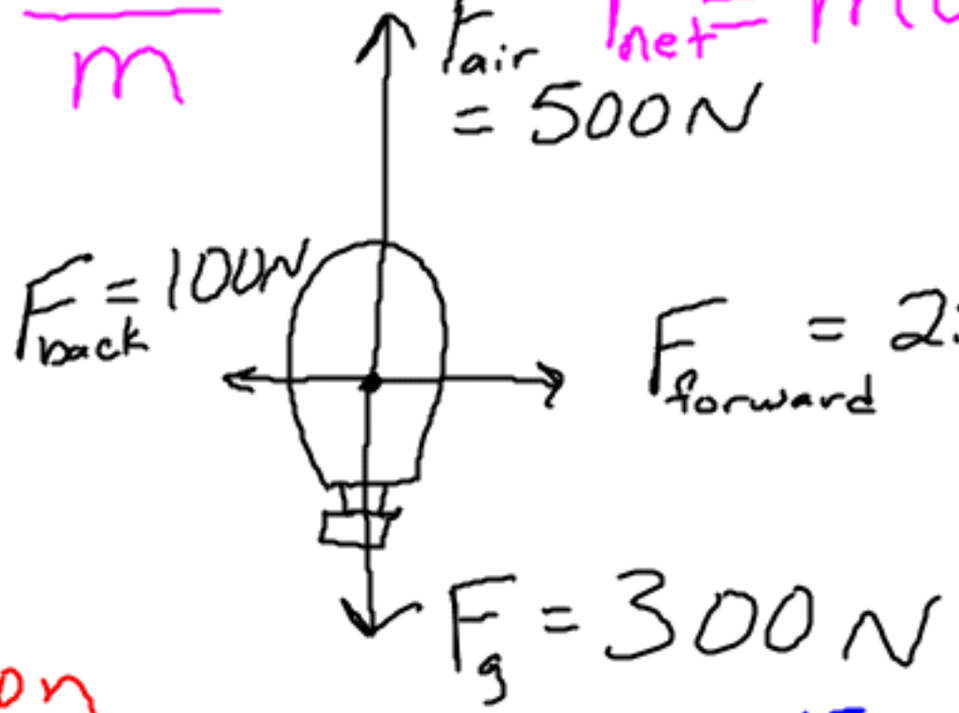
$$5t^2 - 69.3t + 60 = 0$$

Forces what we know...

$a = \frac{F}{m}$ $F_{net} = ma$

Balloon

$m = 30\,kg$



What acceleration is it going?

$a = \frac{F_{net}}{m} = \frac{250}{30} = 8.3\,m/s^2$

How high after 10s?

Vertical acc.

$a = \frac{F_{net\ (vert)}}{m}$

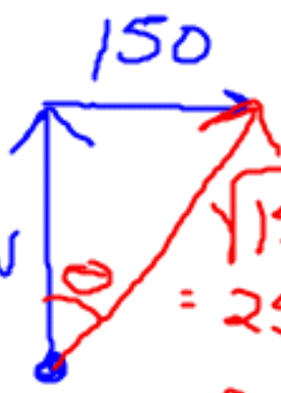
$= \frac{200N}{30}$

$= 6.67\,m/s^2$

$d_f = \frac{1}{2}at^2$

$= \frac{1}{2}(6.67)(10^2)$

$= 333.5\,m$

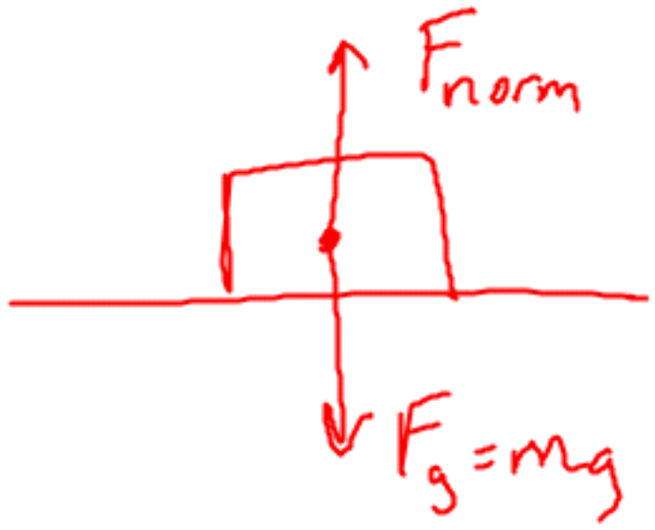


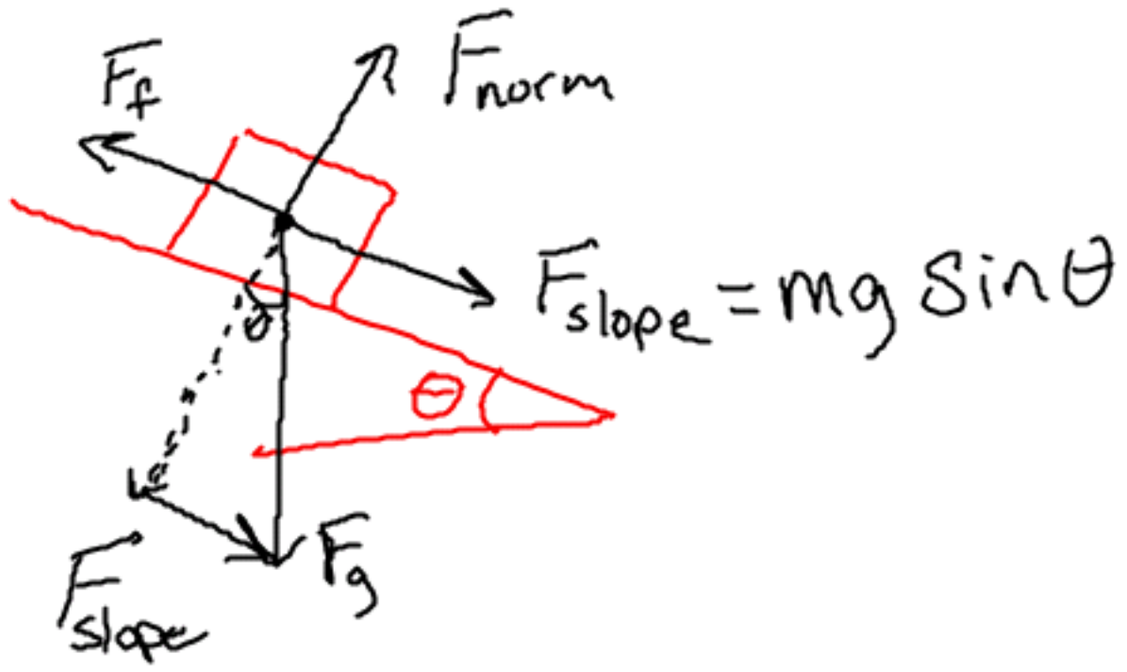
$\sqrt{150^2 + 200^2} =$

$= 250N$

$\theta = \tan^{-1}\frac{150}{200}$

$= 37^\circ$ forward from up


F_{norm}
$F_g = mg$


F_f
F_{norm}
$F_{slope} = mg \sin\theta$
θ
θ
θ
F_{slope}
F_g

$$F_f = F_{norm}\,\mu$$

A)

Assume + is up

$F_{ten} = 1000\,N$

$F_{net} = 0 = F_{ten} + F_g$

$F_g = mg$

$= (100)(-10)$

$= -1000\,N$

B)

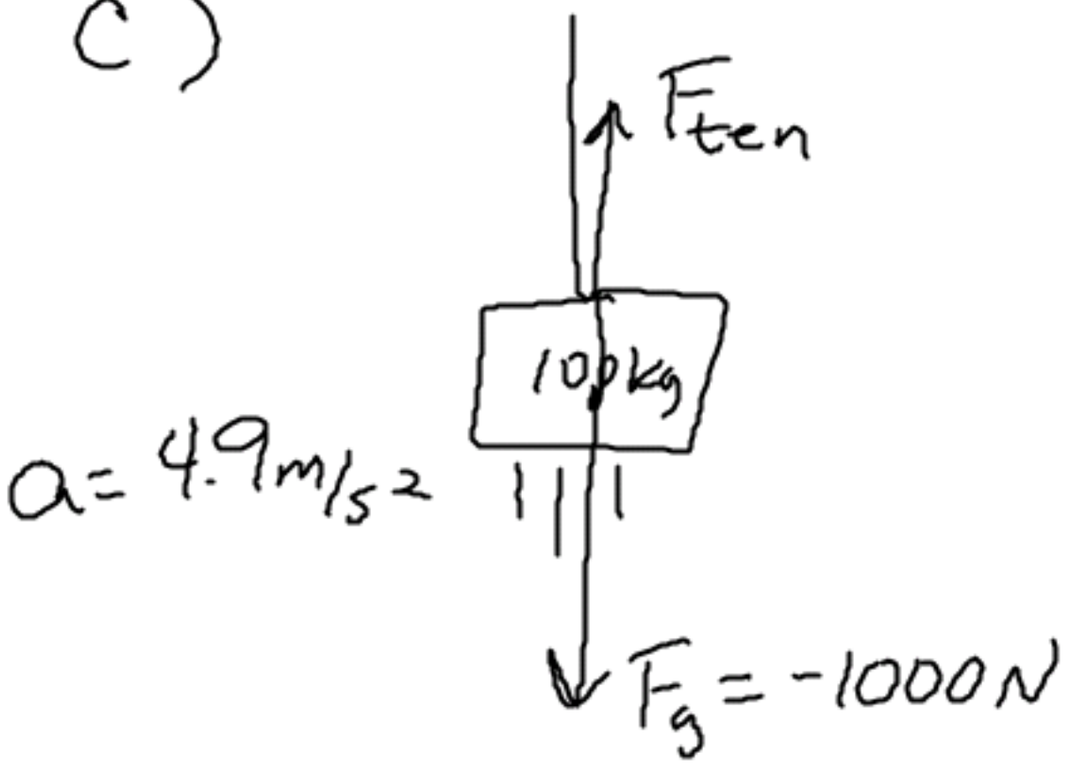
$a = 4\,m/s^2 \downarrow$

$F_{net} = F_{ten} + F_g = ma$

$F_{ten} + (-1000) = 100(-4)$

$F_{ten} = 600\,N$

c)



$$F_{ten} + F_g = ma$$

$$F_{ten} + (-1000) = (100)(4.9)$$

$$F_{ten} = 1490N$$

D) ☆

upward

~~downward~~