Kinematics PS #1

2) $v_f = 19\ m/s$ west

$v_i = 0\ m/s$

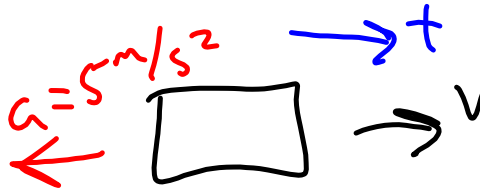
$t = 8.5\ s$ $\Delta x = ?$ $\bar{a} = ?$

$$v_f = v_i + at$$

$$a = \frac{v_f - v_i}{t}$$

$$= \frac{19\ m/s - 0\ m/s}{8.5\ s}$$

$$\bar{a} = 2.24\ m/s^2 \text{ west}$$

5) 

$v_f = 0$ m/s

~~$t = ?$~~

$\Delta x = ?$

(maximum is 800 m)

$$v_f^2 = v_i^2 + 2a\Delta x$$

$$\Delta x = \frac{v_f^2 - v_i^2}{2a}$$

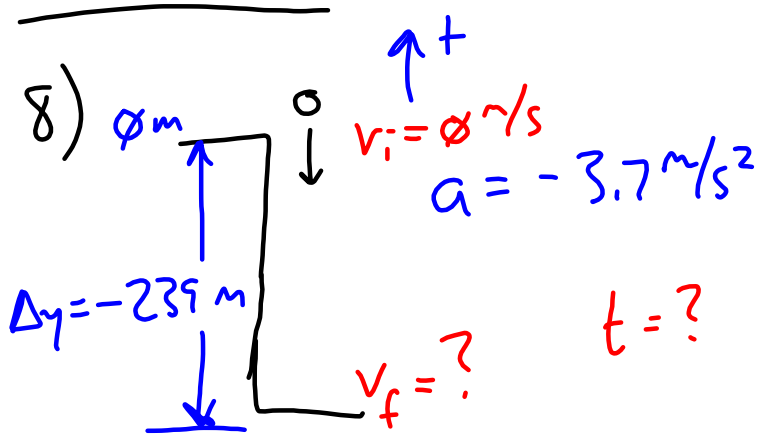
$$= \frac{(0\ \text{m/s})^2 - (100\ \text{m/s})^2}{2(-5\ \text{m/s}^2)}$$

$$= 1000\ \text{m}$$

Build a longer runway!

Hang Time

8)



a) $v_f^2 = v_i^2 + 2a\Delta y$

$v_f = \pm\sqrt{v_i^2 + 2a\Delta y}$

$= \pm\sqrt{(0\ m/s)^2 + 2(-3.7\ m/s^2)(-239\ m)}$

$= -42.06$ m/s

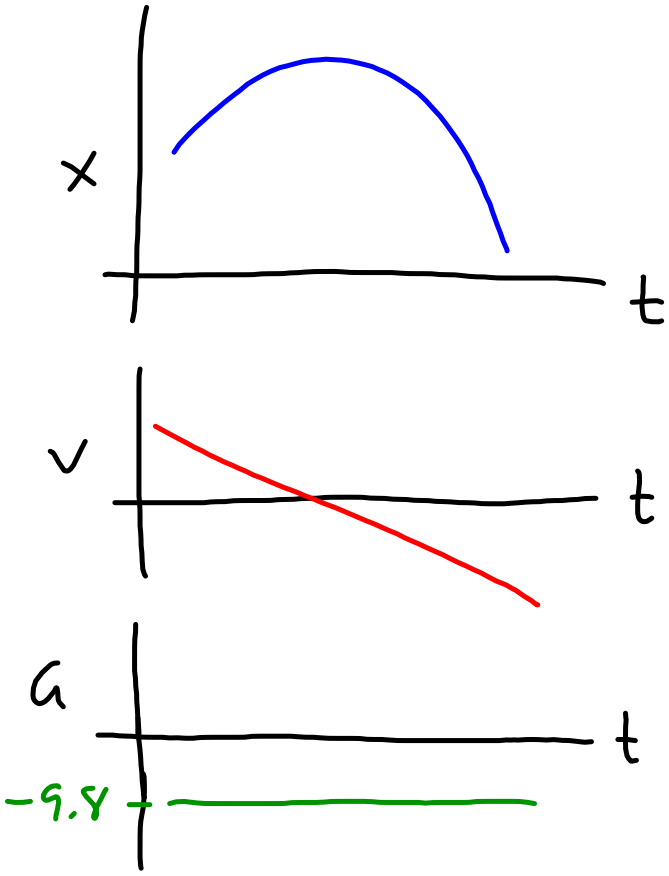
b) $v_f = v_i + at$

$t = \dfrac{v_f - v_i}{a}$

$= \dfrac{-42.06\ m/s - 0\ m/s}{-3.7\ m/s^2}$

$= 11.4$ s

LAB - FREE FALL



	going up	at top	coming down
X	+	+	+
V	+	∅	−
a	−	−	−