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

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

$$v_f = v_i + at$$

Activity – Texting While Driving

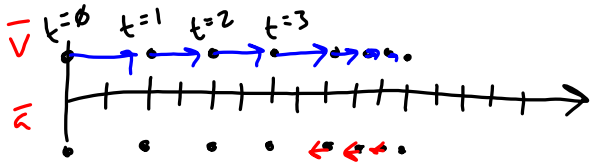
1) 3s for text

2) $\Delta x = v_i t + \frac{1}{2} \cancel{a}^{0} t^2$

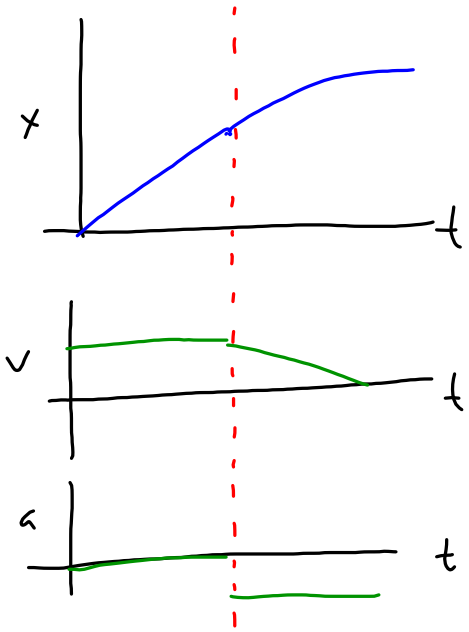
$= (20\ m/s)(3\ s)$

$= 60\ m$

3) a.



b.



C. $115\ m - 60\ m = 55\ m$

$v_i = 20\ m/s$

$a = -5\ m/s^2$

$\Delta x = ?$

$v_f = 0\ m/s$

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

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

$= \frac{(0\ m/s)^2 - (20\ m/s)^2}{2(-5\ m/s^2)}$

$= 40\ m$

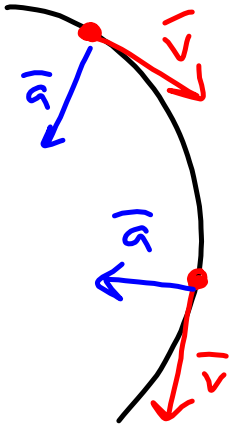
Review

Traffic circle at 18 km/h

Constant speed? YES

Constant velocity? NO

Constant acceleration? YES



Top of trajectory (on Earth)

$\bar{v} = 0$ m/s

$\bar{a} = 9.8$ m/s^2 down

Units: $x \rightarrow$ m

$v \rightarrow$ m/s

$a \rightarrow$ m/s^2

$-\bar{v}$ and $+\bar{a} \rightarrow$ slowing down

1)

distance = 10m $\quad \Delta x = 2m$ east

2)

$$v_f = v_i + at$$

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

$$= \frac{0\ m/s - 9\ m/s}{-4.1\ m/s^2}$$

$$= 2.2\ s$$

3) $v_f = 28.8\ m/s$

$t = 4\ s$

$a = -5.92\ m/s^2$

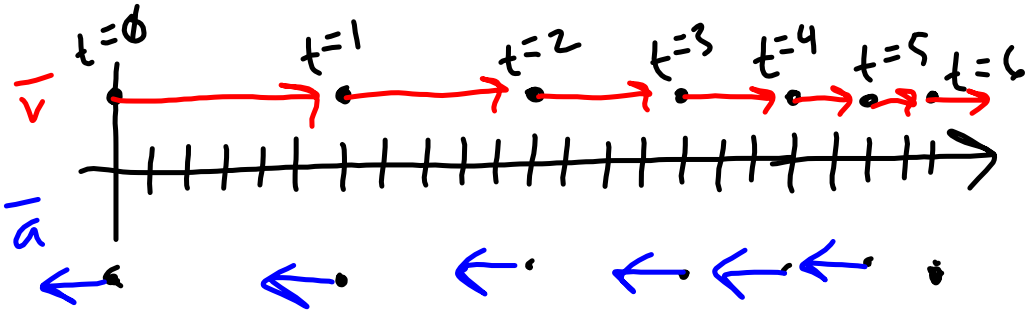
$v_i = ?$

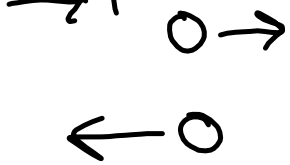
$v_f = v_i + at$

$v_i = v_f - at$

$= 28.8\ m/s - (-5.92\ m/s^2)(4\ s)$

$= 52.48\ m/s$



4) 

$v_i = 12\ m/s$

$v_f = -10\ m/s$

$t = 0.2\ s$

$a = ?$

$$v_f = v_i + at$$

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

$$= \frac{-10\ m/s - 12\ m/s}{0.2\ s}$$

$$= -110\ m/s^2$$

5) a. $v_{top} = 0\ m/s$

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

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

$$= \frac{(0\ m/s)^2 - (24\ m/s)^2}{2(-9.8\ m/s^2)}$$

$$= 323.5\ m$$

d. $\uparrow^+$ $v_i = 24\ m/s$ $t = ?$

$v_f = -24\ m/s$ $a = -9.8\ m/s^2$

$$v_f = v_i + at$$

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

$$= \frac{-24\ m/s - (24\ m/s)}{-9.8\ m/s^2}$$

$$= 4.9\ s$$

C. 2.45 s