$V_{av} = -1.24\ m/s$ (west)

$\Delta x_w = 6.44\ km = -6440\ m$

$V_{av_w} = -2.52\ m/s$

$V_{ave} = .5\ m/s$

$\Delta x_e = ?$

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

$-1.24\ m/s = \frac{\Delta x_e + \Delta x_w}{\Delta t_e + \Delta t_w}$

$V_{av_w} = -2.52\ m/s = \frac{-6440\ m}{\Delta t_w}$

$\Delta t_w = 2555.6\ s$

$\frac{\Delta t_e}{.5} = \frac{\Delta x_e}{\Delta t_e} \cdot \frac{\Delta t_e}{.5}$

$\Delta t_e = \frac{\Delta x_e}{.5}$

$-1.24 = \frac{\Delta x_e - 6440}{\frac{\Delta x_e}{.5} + 2555.6}$

$-1.24 = \frac{\Delta x_e - 6440}{\frac{\Delta x_e + 1277.8}{.5}}$

$-1.24 = \frac{\Delta x_e - 6440}{1} \cdot \frac{.5}{\Delta x_e + 1277.8}$

$-1.24(\Delta x_e + 1277.8) = .5\Delta x_e - 3220$

$-1.24\Delta x_e - 1584.4 = .5\Delta x_e - 3220$

$+1.24\Delta x_e \quad\quad +1.24\Delta x_e$

$1635.6 = 1.74\Delta x_e$

$\Delta x_e = 940\ m$

$= .94\ km$

$v_{av_{ride}} = 3.10\ m/s$

$\Delta t_{ride} = 29\ s$

$v_{av_{tot}} = \frac{\Delta x}{\Delta t}$

$v_{av_{walk}} = 1.4\ m/s$

$v_{av_{tot}} = 2.2\ m/s$

$= \frac{\Delta x_{ride} + \Delta x_{walk}}{\Delta t_{ride} + \Delta t_{walk}}$

$v_{av_{ride}} = 3.10 = \frac{\Delta x_{ride}}{29\ s}$ $\cdot 29$

$90\ m = \Delta x_{ride}$

$v_{av_{walk}} = 1.4 = \frac{\Delta x_{walk}}{\Delta t_{walk}}$ $\cdot \Delta t_{walk}$

$\Delta x_{walk} = 1.4\ \Delta t_{walk}$

$(29 + \Delta t_w)\ 2.2 = \frac{90\ m + 1.4\ \Delta t_{walk}}{(29 + \Delta t_{walk})}$ $(29 + \Delta t_w)$

$63.8 + 2.2\ \Delta t_w = 90\ m + 1.4\ \Delta t_w$

$-63.8 \quad -1.4\ \Delta t_w \quad -63.8 \quad -1.4\ \Delta t_w$

$.8\ \Delta t_w = 26.2$

$\Delta t_w = 32.75\ s$

$V_i = 0$

$V_f = 6.5\ m/s$

$t = 4.1\ s$

$a = ?$

$V_f = V_i + at$

$\frac{6.5}{4.1} = \frac{0 + a(4.1)}{4.1}$

$a = 1.59\ m/s^2$

$\Delta x = \cancel{V_i t} + \frac{1}{2}at^2$ ($V_i = 0$)

$\Delta x = \frac{1}{2}(1.59)(4.1)^2$

$= 13.36\ m$

$V_i = +30.\ m/s$ engine stops

$\bar{a}_1$ = for 10 s

then slows down further

$\bar{a}_2$ = for 5 s

$V_f = +20.7\ m/s$ (after 15 s)

$\frac{\bar{a}_1}{\bar{a}_2} = 1.24$ $\boxed{V_{f_1} = ?}$

$\bar{a}_1 = \frac{V_{f_1} - 30}{10} = \frac{\Delta V_1}{\Delta t_1}$ $\frac{\bar{a}_1}{\bar{a}_2} = 1.24$

$\bar{a}_2 = \frac{20.7 - V_{f_1}}{5}$

$$\frac{\frac{V_{f_1} - 30}{10}}{\frac{20.7 - V_{f_1}}{5}} = 1.24$$

$$\frac{V_{f_1} - 30}{2} \cdot \frac{1}{20.7 - V_{f_1}} = 1.24$$

$$\frac{V_{f_1} - 30}{41.4 - 2V_{f_1}} = 1.24 \quad (41.4 - 2V_{f_1})$$

$$1V_{f_1} - 30 = 51.34 - 2.48V_{f_1}$$

$$+2.48 \quad +30 \quad +30 \quad +2.48V_{f_1}$$

$$\frac{3.48V_{f_1}}{3.48} = \frac{81.34}{3.48}$$

$\boxed{V_{f_1} = 23.37\ m/s}$

$V_t = 3.5\ m/s$ $\quad v = \frac{\Delta x}{\Delta t}$

$\Delta x = d$

$V_b = 6\ m/s$ $\quad d = ?$

$\Delta x = 27 + d$

$V_t = \frac{d}{\Delta t} = 3.5$ $\quad d = 3.5\,\Delta t$

$\Delta t = \frac{3.5}{d}$

$V_b = \frac{27+d}{\Delta t} = 6$ $\quad \Delta t = \frac{27+d}{6} = \frac{d}{3.5}$

$\frac{27+3.5\Delta t}{\Delta t} = 6\,\Delta t$

$27 + 3.5\Delta t = 6\Delta t$

$-3.5\Delta t \quad -3.5\Delta t$

$\frac{27}{2.5} = \frac{2.5\Delta t}{2.5}$

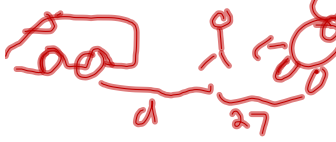
$\Delta t = 10.8\ s$

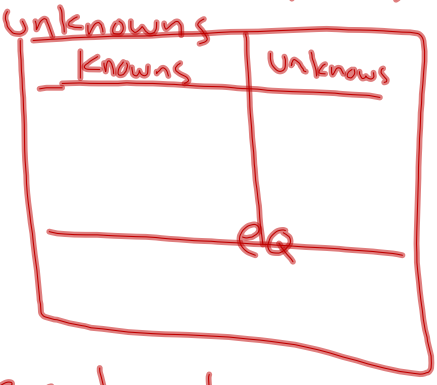
$d = (3.5)(10.8)$

$= 37.8\ m$

General Problem Solving

1. Read Problem
2. Re-Read Problem
   - Highlight and/or underline important information.
     - * Numbers, Units, directions, keywords, -> "Looking for, rest, Constant
3. Write out all important info seperately. i.e. $V_i = 0$
4. Draw Picture
5. Label Picture
6. Write out knowns + unknowns





7. Write out relevant eqn.s
8. Solve Problem
9. CHECK
   - -> math
   - -> reality - "does it make sense"
   - -> units
10. What is problem asking for?

- 1 - D Motion + Kinematics

- Free - Fall →
  → Constant "a"

an object traveling through the air with nothing acting on it other than gravity. (something still starts prob.)

- Neglect - air resistance + friction.

- 1 Dimension
  "straight up + down"

gravity = g

Direction = towards Earth
(usually "−")