Free Fall on Planet Newtonia

b) $A \to E$

$$\bar{v} = \frac{\Delta \bar{x}}{\Delta t} = \frac{20\,m - 0\,m}{4\,s - 0\,s} = 5\ m/s$$

$t_f - t_i$

c) $A \to C$

$$\bar{v} = \frac{\Delta \bar{x}}{\Delta t} = \frac{8\,m - 0\,m}{2\,s - 0\,s} = 4\ m/s$$

e) Instantaneous velocity at a mid-time event is equal to average velocity of the event.

$$\bar{v}_{\text{average } A \to C} = \bar{v}_{\text{inst. at } B}$$

↳ mid-time of $A \to C$

4 m/s

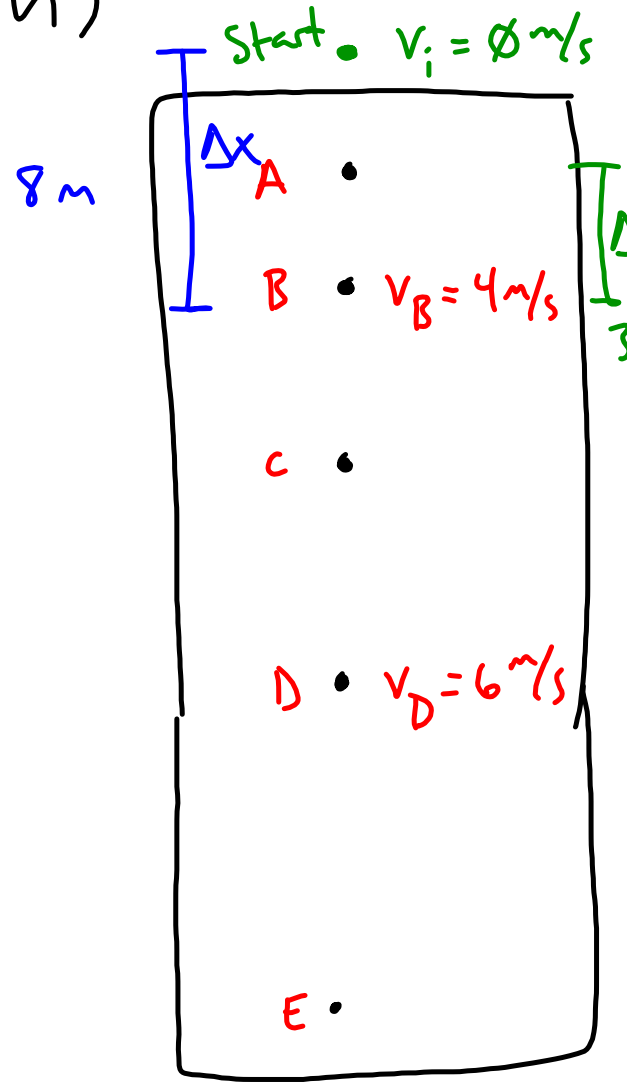
d) $C \to E$

$$\bar{v} = \frac{\Delta \bar{x}}{\Delta t} = \frac{12\,m - 0\,m}{4\,s - 2\,s} = 6\ m/s$$

f) $\bar{v}_{\text{average } C \to E} = \bar{v}_{\text{inst. } D} = 6\ m/s$

g) $$\bar{a} = \frac{\Delta \bar{v}}{\Delta t} = \frac{\bar{v}_D - \bar{v}_B}{t_D - t_B} = \frac{6\,m/s - 4\,m/s}{3\,s - 1\,s} = 1\ m/s^2$$

h)



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

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

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

$$= \frac{(4\text{ m/s})^2 - (0\text{ m/s})^2}{2(1\text{ m/s}^2)}$$

$$= 8\text{ m}$$

$$\Delta x = \Delta x_{AB} + \Delta x_{start}$$

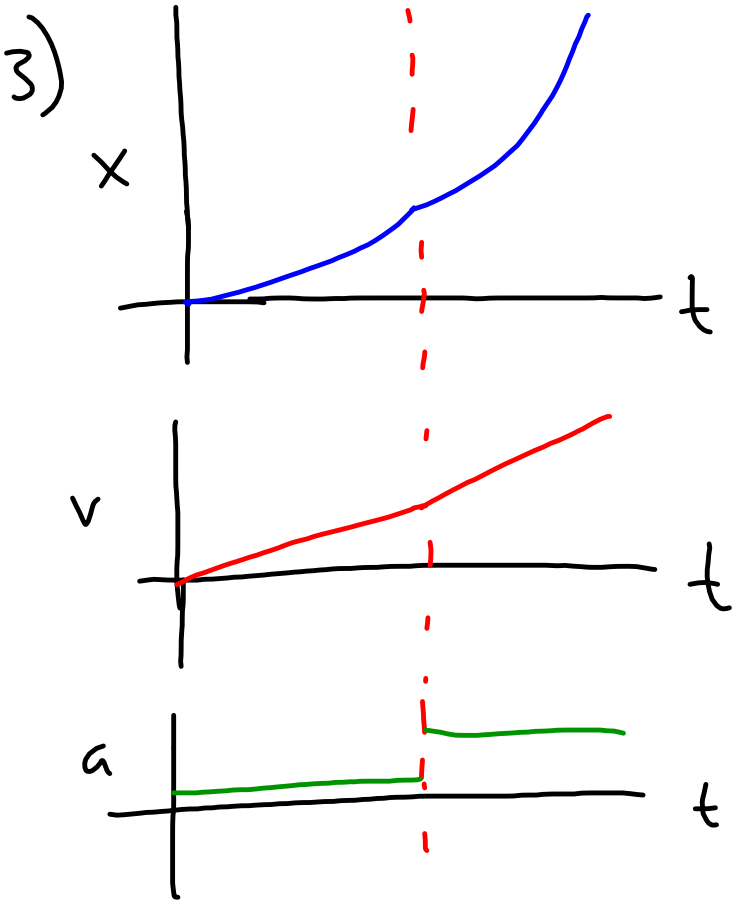
$$\Delta x_{start} = \Delta x - \Delta x_{AB}$$

$$= 8\text{ m} - 3.5\text{ m}$$

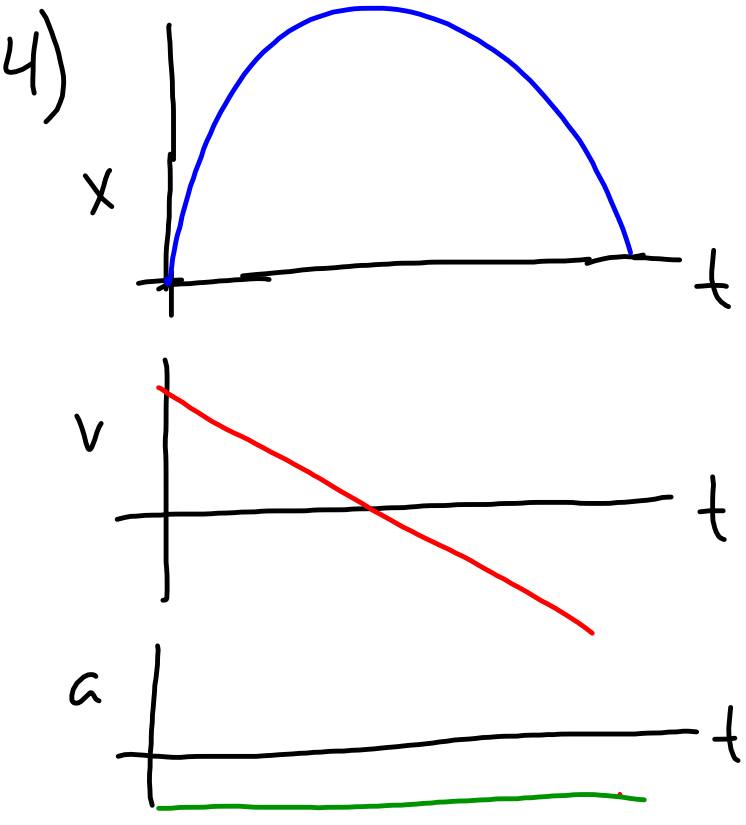
$$= 4.5\text{ m}$$

Ball on Ramp

3)



4)



up the ramp is positive

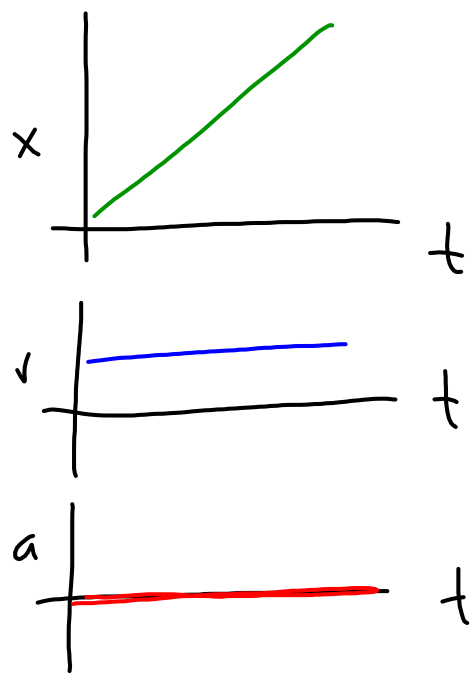
Ch. 2 Review (p. 69, 71)

13 → do x, v, a graphs for all parts

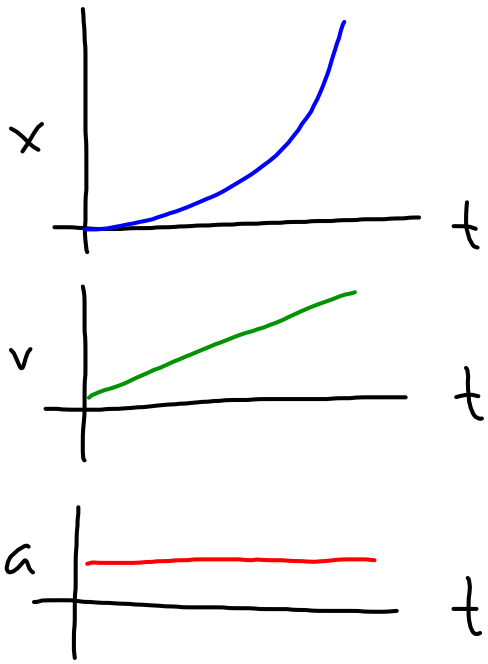
34

37

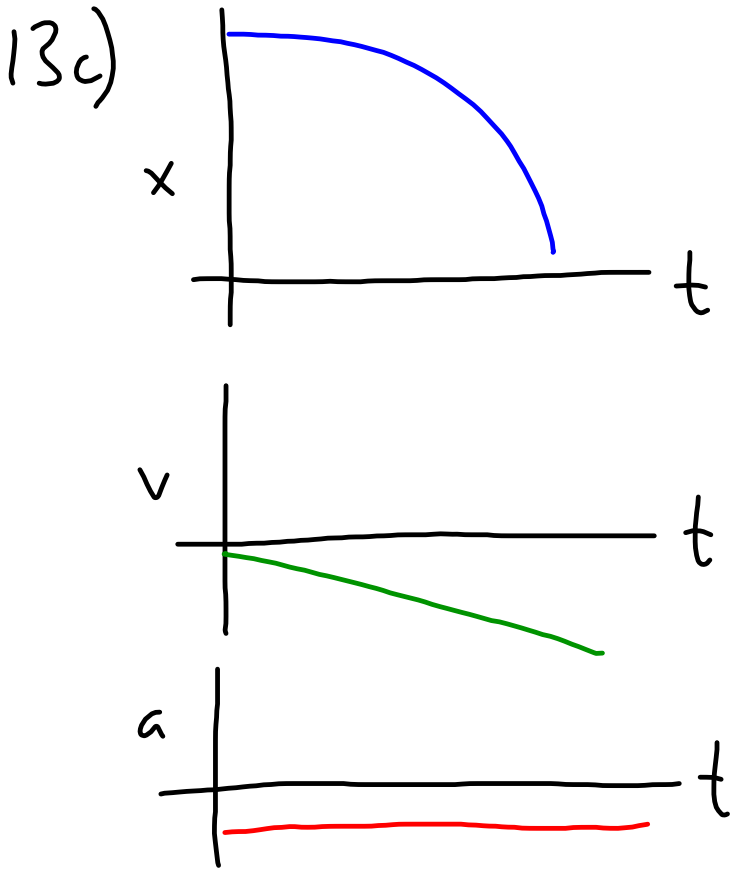
13a)



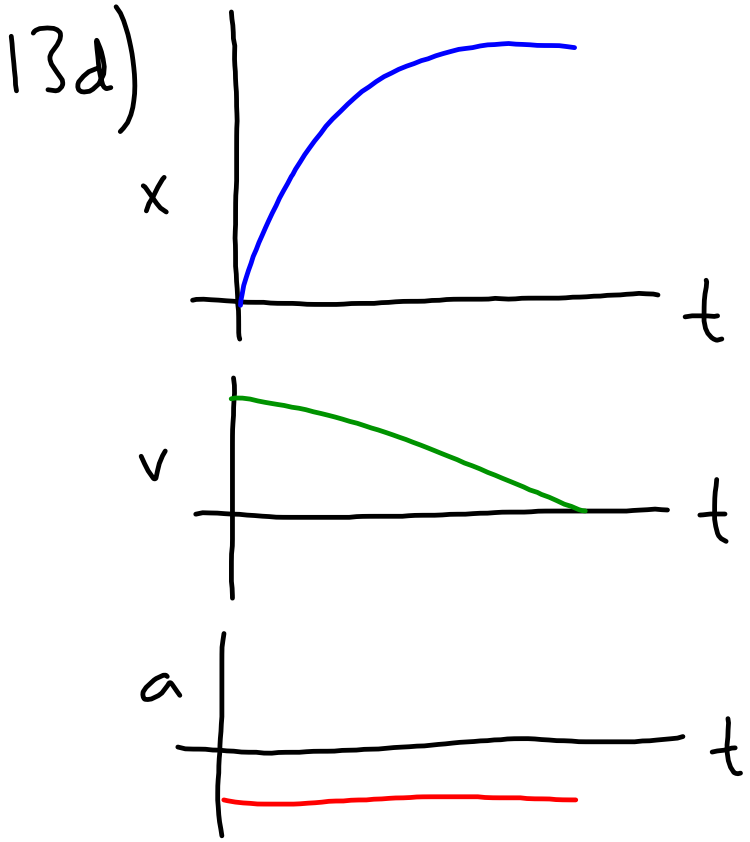
13b)



13c)



13d)



13e)