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1. $t = 2.2 \text{ s}$

2. $t = 2 \text{ s}$

3. $t = 5.4 \text{ s}$

4. $a = -3.5 \times 10^{-3} \text{ m/s}^2$

5. a) $v = 1.4 \text{ m/s}$

b) $v_f = 3.1 \text{ m/s}$

$$v_i = -1.2 \text{ m/s}$$

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

$$\Delta t = 25 \text{ min} \times \frac{60 \text{ s}}{1 \text{ min}} = 1500 \text{ s}$$

$$v_f = -6.5 \text{ m/s}$$

$$a = \frac{-6.5 - (-1.2)}{1500}$$

$$a = -3.5 \times 10^{-3} \text{ m/s}^2$$

$$5 \text{ a) } a = 4.7 \times 10^{-3} \text{ m/s}^2$$
$$\Delta t = 5 \text{ min} = 300 \text{ s}$$

$$a = \frac{\Delta v}{\Delta t}$$

$$4.7 \times 10^{-3} = \frac{\Delta v}{300}$$

$$\Delta v = 1.4 \text{ m/s}$$

$$b) \quad \Delta v = v_f - v_i$$

$$1.4 \text{ m/s} = v_f - 1.7$$

+1.7 +1.7

$$v_f = 3.1 \text{ m/s}$$

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1. $v_f = 9.8 \text{ m/s}$; $x = 29 \text{ m}$

2. $v_f = 19.3 \text{ m/s}$; $x = 59 \text{ m}$

3. $v_f = -7.5 \text{ m/s}$; $x = -18.75 \text{ m}$

4. $t = 2.5 \text{ s}$; $x = 31.25 \text{ m}$

$$\Delta x = \frac{1}{2} (v_f + v_i) \Delta t$$

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

1.

$$v_f = 9.8 \text{ m/s}$$

$$\begin{aligned}\Delta x &= \frac{1}{2} (v_i + v_f) \Delta t \\ &= \frac{1}{2} (6.5 + 9.8) 3.6 \\ &= 29 \text{ m}\end{aligned}$$

3.

Δx	v_f	v_i	a	Δt
?		0	-1.5	5

$$v_f = v_i + a\Delta t$$
$$= 0 + (-1.5)(5)$$

$$v_f = -7.5 \text{ m/s}$$

$$\Delta x = \frac{1}{2} (v_i + v_f) \Delta t$$
$$= \frac{1}{2} (0 + -7.5) 5$$

$$\Delta x = -18.75 \text{ m}$$

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2. a) $v_f = 21 \text{ m/s}$

b) $v_f = 15.8 \text{ m/s}$

c) $v_f = 12.5 \text{ m/s}$

3. a) $v_f = 15.9 \text{ m/s}$

b) $t = 6.9 \text{ s}$

4. $x = 7.4 \text{ m}$

5. $a = 2.3 \text{ m/s}^2$

$$v_f^2 = v_i^2 + 2ax$$

3b

Δx	v_i	v_f	a	Δt
55	0		2.3	

3a) $v_f = 15.9 \text{ m/s}$

$$v_f = v_i + a\Delta t$$

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

$$\frac{15.9 - 0}{2.3} = \boxed{6.9 \text{ s}}$$

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

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

$$4) \begin{array}{c|c|c|c|c} \Delta x & v_i & v_f & a & \Delta t \\ \hline ? & -6.5 & -1.5 & 2.7 & \end{array}$$

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

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

$$\frac{(-1.5)^2 - (-6.5)^2}{2(2.7)} = \boxed{\Delta x = 7.4\text{m}}$$

5)

Δx	v_i	v_f	a	Δt
240	0	33	?	

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

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

$$\frac{33^2 - 0^2}{2(240)} = a = 2.3 \text{ m/s}^2$$