

Pg 410-411

1. In constant acceleration the SPEED is constant

2. A → 3
B → 1
C → 2

3. a) the object is not moving
b) the object has a constant speed
c) the object is accelerating
d) the object has a constant speed, the acceleration is zero
e) the object has a constant acceleration, the objects speed is increasing

$$\begin{aligned} 7. \quad v_2 &= 6.0 \text{ m/s} & a &= \frac{v_2 - v_1}{t} \\ v_1 &= 0 \text{ m/s} & a &= \frac{6.0 - 0 \text{ m/s}}{3.0 \text{ s}} \\ t &= 3.0 \text{ s} & a &= 2 \text{ m/s}^2 \end{aligned}$$

$$\begin{aligned} 8. \quad t &= 0.10 \text{ s} \\ a &= 45 \text{ m/s}^2 \\ v &= ? \end{aligned}$$

$$\begin{aligned} v &= at \\ v &= (45 \text{ m/s}^2)(0.10 \text{ s}) \\ v &= 4.5 \text{ m/s} \end{aligned}$$

$$\begin{aligned} 9. \quad v &= 35 \text{ km/h} \\ t &= 4.0 \text{ min} \end{aligned}$$

$$\begin{aligned} a &= \frac{v}{t} \\ a &= \frac{35 \text{ km/h}}{4.0 \text{ min}} \\ a &= 8.75 \text{ km/h/min} \end{aligned}$$

$$10. a = 0.10 \text{ m/s}^2$$

$$v = 5.0 \text{ m/s}$$

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

$$t = \frac{5.0 \text{ m/s}}{0.10 \text{ m/s}^2}$$

$$t = 50 \text{ s}$$

$$11. a = 1.5 \text{ km/s}^2$$

$$t = 1.0 \text{ ms}$$

$$v_2 = ?$$

$$v = at$$

$$v = (1.5 \text{ km/s}^2)(1.0 \text{ ms})$$

$$v = 1.5 \text{ km/ms}^3$$

$$12. a = 0.50 \text{ m/s}^2$$

$$v_2 = 9.7 \text{ m/s}$$

$$t = 15 \text{ s}$$

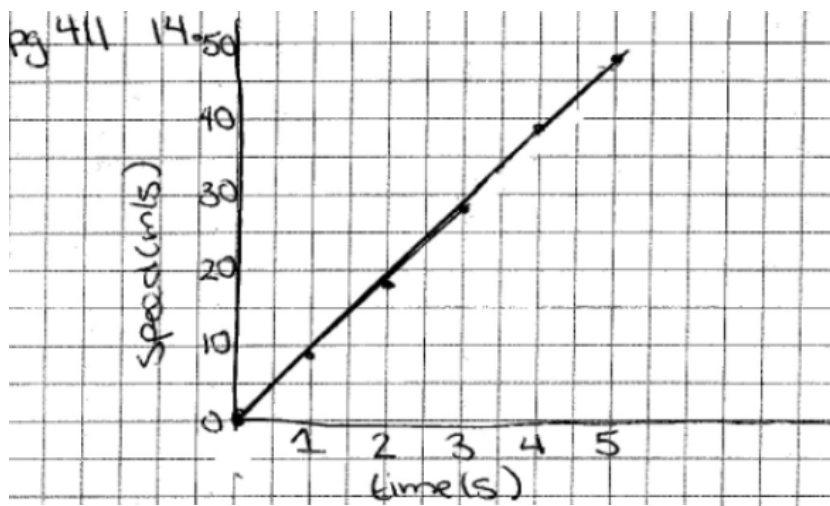
$$v_1 = ?$$

$$v_1 = v_2 - at$$

$$v_1 = 9.7 \text{ m/s} - (0.50 \text{ m/s}^2)(15 \text{ s})$$

$$v_1 = 9.7 \text{ m/s} - 7.5 \text{ m/s}$$

$$v_1 = 2.2 \text{ m/s}$$



$$14b) a = \frac{v_2 - v_1}{t_2 - t_1} \text{ or } \frac{y_2 - y_1}{x_2 - x_1}$$

$$a = \frac{49.5 - 0}{5.0 - 0}$$

$$a = \frac{49.5 \text{ m/s}}{5 \text{ s}}$$

$$a = 9.9 \text{ m/s}^2$$

$$c) D = \frac{1}{2} vt$$

$$D = \frac{1}{2} (50)(5)$$

$$D = \frac{1}{2} (250)$$

$$D = 125 \text{ m}$$

$$\begin{aligned}
 1. \quad t &= 4s \\
 v_2 &= 9 \text{ m/s} \\
 v_1 &= 5 \text{ m/s} \\
 a &= \frac{v_2 - v_1}{t} \\
 a &= \frac{9 \text{ m/s} - 5 \text{ m/s}}{4s} \\
 a &= \frac{4 \text{ m/s}}{4s} \\
 a &= 1 \text{ m/s}^2
 \end{aligned}$$

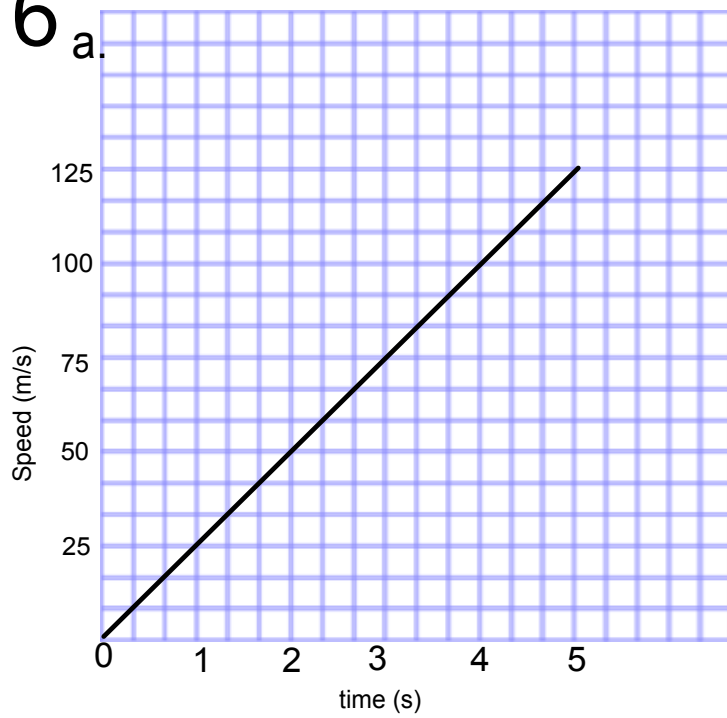
$$\begin{aligned}
 2. \quad a &= 2.2 \text{ m/s}^2 \\
 t &= 2.5s \\
 v_1 &= 0 \\
 v_2 &=? \\
 v_2 &= v_1 + at \\
 v_2 &= 0 + (2.2 \text{ m/s}^2)(2.5s) \\
 v_2 &= 5.5 \text{ m/s}
 \end{aligned}$$

$$\begin{aligned}
 3. \quad v_1 &=? \\
 v_2 &= -50 \text{ km/h} \\
 a &= 2.0 \text{ m/s}^2 \\
 t &= 2.3s \\
 v_2 &= -50 \text{ km/h} \div 3.6 = -13.9 \text{ m/s} \\
 v_1 &= v_2 - at \\
 v_1 &= -13.9 \text{ m/s} - (2.0 \text{ m/s}^2)(2.3s) \\
 v_1 &= -13.9 \text{ m/s} - 4.6 \text{ m/s} \\
 v_1 &= -18.5 \text{ m/s}
 \end{aligned}$$

$$\begin{aligned}
 4. \quad a &= 9.81 \text{ m/s}^2 \\
 v_2 &= 19.4 \text{ m/s} \\
 v_1 &= 4.5 \text{ m/s} \\
 t &=? \\
 t &= \frac{v_2 - v_1}{a} \\
 t &= \frac{19.4 \text{ m/s} - 4.5 \text{ m/s}}{9.81 \text{ m/s}^2} \\
 t &= \frac{14.9 \text{ m/s}}{9.81 \text{ m/s}^2} \\
 t &= 1.52s
 \end{aligned}$$

$$\begin{aligned}
 5. \quad a) \quad a &= \frac{y_2 - y_1}{x_2 - x_1} = \frac{10 - 10}{150 - 0} = \frac{0}{150} = 0 \text{ m/s}^2 \\
 b) \quad a &= \frac{y_2 - y_1}{x_2 - x_1} = \frac{30 - 10}{250 - 150} = \frac{20}{100} = 0.2 \text{ m/s}^2 \\
 c) \quad a &= \frac{y_2 - y_1}{x_2 - x_1} = \frac{30 - 30}{300 - 250} = \frac{0}{50} = 0 \text{ m/s}^2 \\
 d) \quad a &= \frac{y_2 - y_1}{x_2 - x_1} = \frac{5 - 30}{350 - 300} = \frac{-25}{50} = -0.5 \text{ m/s}^2 \\
 5. \quad e) \quad D_A &= vt \\
 D_A &= (150)(10) \\
 D_A &= 1500 \text{ m}
 \end{aligned}$$

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b)

$$a = \frac{v_2 - v_1}{t_1 - t_2}$$

$$a = \frac{125 \text{ m/s} - 0 \text{ m/s}}{5 \text{ s} - 0 \text{ s}}$$

$$a = \frac{125 \text{ m/s}}{5 \text{ s}}$$

$$a = 25 \text{ m/s}^2$$

c)

$$D = \frac{1}{2} v t$$

$$D = \frac{1}{2} (125) (5)$$

$$D = \frac{1}{2} (625)$$

$$D = 312.5 \text{ m}$$