# **Fully-Worked Solutions**

## PRACTICE 9

### Section A

1 Speed = 
$$\frac{200 \text{ m}}{20.63 \text{ s}}$$
  
= 9.69 m s<sup>-1</sup>

Ahmad wins because his time taken is shorter.

Answer: C

2 A straight line graph represents uniform speed. Answer: A

**3** The hand of clock moves an equal distance over equal time interval.

Answer: D

4 Speed = 
$$\frac{174 \text{ km}}{2.5 \text{ h}}$$
  
= 69.6 km h<sup>-1</sup>

Answer: B

5 
$$175 \text{ m/s} = \frac{175 \text{ m}}{1 \text{ s}}$$
  
=  $\frac{175 \div 1000 \text{ km}}{1 \div 60 \text{ min}}$   
=  $10.5 \text{ km/min}$ 

Answer: C

6 Distance = 
$$(28 \times 3 \times 60)$$
 m  
=  $5 040$  m  
=  $\frac{5 040}{1 000}$  km  
=  $5.04$  km

Answer: B

7 Distance = Speed × Time  
= 
$$87 \times 2\frac{1}{3}$$
 km  
=  $87 \times \frac{7}{3}$  km  
=  $203$  km

Answer: D

8 Time = 
$$\frac{187 \text{ km}}{68 \text{ km/h}}$$
  
= 2.75 h

Answer: C

9 Time = 
$$\frac{300}{80}$$
h  
= 3.75 h  
Average speed =  $\frac{300}{4.25}$  km/h  
= 70.59 km/h

Answer: A

10 Speed = 
$$\frac{286 \text{ km}}{3.25 \text{ h}}$$
  
= 88 km/h

Answer: B

11 96 km/h = 
$$\frac{96 \text{ km}}{1 \text{ h}}$$
  
=  $\frac{96 \text{ km}}{60 \times 60 \text{ s}}$   
=  $\frac{2}{75}$  km/s

Acceleration = 
$$\frac{\left(\frac{2}{75} - 0\right) \text{ km/s}}{8 \text{ s}}$$
$$= 0.00333 \text{ km/s}^2$$

Answer: A

12 Acceleration = 
$$\frac{18 - 8}{5}$$
$$= 2 \text{ m/s}^2$$

Answer: D

13 Acceleration = 
$$\frac{0-24}{20}$$
  
=  $\frac{-24}{20}$  m/s<sup>2</sup>  
= -1.2 m/s<sup>2</sup>

Answer: A

14 Acceleration = 
$$\frac{0 - 80 \text{ km/h}}{8 \text{ s}}$$
  
= -10 km/h per second  
Deceleration = 10 km/h per second  
Answer: C

15 Acceleration = 
$$\frac{105 - 65 \text{ km/h}}{15 \text{ min}}$$
$$= \frac{40 \text{ km/h}}{\frac{1}{4} \text{ h}}$$
$$= 160 \text{ km/h}^2$$

Answer: D

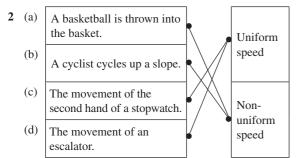
16 Acceleration = 
$$\frac{36 - 68 \text{ m/min}}{5 \text{ min}}$$
$$= -\frac{32}{5} \text{ m/min}^2$$
$$= -6.4 \text{ m/min}^2$$
Deceleration = 6.4 m/min<sup>2</sup>  
Answer: **B**

17 Acceleration = 
$$\frac{12 - 0}{\frac{2}{3} \times 60 \text{ s}}$$
$$= \frac{12 \text{ m/s}}{40 \text{ s}}$$
$$= 0.3 \text{ m/s}^2$$

Answer: A

#### **Section B**

- 1 (a) X
  - (b) 🗸
  - (c) 🗸
  - (d) X

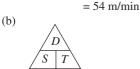


3 (a) (i) 
$$108 \text{ km/h} = \frac{108 \text{ km}}{1 \text{ h}}$$

$$= \frac{108 \times 1000 \text{ m}}{60 \text{ min}}$$

$$= 1800 \text{ m/min}$$
(ii)  $90 \text{ cm/s} = \frac{90 \text{ cm}}{1 \text{ s}}$ 

$$= \frac{90 \div 100 \text{ m}}{1 \div 60 \text{ min}}$$



D = Distance

S = Speed

T = Time

 $D = S \times T$ 

$$S = \frac{D}{T}$$

$$T = \frac{D}{S}$$

(i)	Distance = Speed × Time	1
(ii)	Speed = Time Distance	
(iii)	$Time = \frac{Distance}{Speed}$	1

4 (a) 
$$680 \text{ m/min}^2 = \frac{680 \text{ m}}{1 \text{ min}^2}$$
  

$$= \frac{680 \div 1000 \text{ km}}{1 \text{ min}^2}$$

$$= 0.68 \text{ km/min}^2$$

$$96 \text{ km/h}^2 = \frac{96 \text{ km/h}}{1 \text{ h}}$$

$$=\frac{96 \text{ km/h}}{3600 \text{ s}}$$

= 0.0267 km/h per second

- (b) (i) Deceleration: Speed decreases
  - (ii) Acceleration: Speed increases

### **Section C**

1 (a) (i) Distance = 
$$18 \times 3 \times 60 \text{ m}$$
  
= 3 240 m  
= (3 240 ÷ 1 000) km  
= 3.24 km

(ii) Time = 
$$\frac{720 \text{ m}}{18 \text{ m/s}}$$
  
= 40 s

(b) (i) Distance = 86 km/h × 
$$1\frac{1}{2}$$
 h

$$= 86 \times \frac{3}{2} \text{ km}$$

$$= 129 \text{ km}$$

(ii) Total distance = 
$$129 + 129$$
  
=  $258 \text{ km}$ 

Total time taken

$$= 1.5 + 1.5 + 0.5$$
  
= 3.5 h

$$= 3.5 1$$

Average speed = 
$$\frac{258 \text{ km}}{3.5 \text{ h}}$$
  
= 73.71 km/h

(c) Acceleration = 
$$\frac{(75-90) \text{ km/h}}{15 \text{ min}}$$
  
=  $\frac{-15 \text{ km/h}}{\frac{15}{60} \text{ h}}$   
=  $-15 \times \frac{60}{15} \text{ km/h}^2$   
=  $-60 \text{ km/h}^2$ 

Deceleration =  $60 \text{ km/h}^2$ 

2 (a) (i) Acceleration =  $-1.5 \text{ m/s}^2$ 

$$\frac{0-v}{8} = -1.5$$

$$-v = -1.5 \times 8$$

$$= -12$$

$$v = 12$$

(ii) Distance = 
$$v \times 10$$
  
=  $12 \times 10$   
=  $120 \text{ m}$ 

(b) Distance travelled in the first two hours  $=75\times2$ 

= 150 km

Remaining distance = 
$$348 - 150$$
  
=  $198 \text{ km}$ 

Time taken (Second part) = x hours 1130 - 0615 = 515

5 hours 15 min = 5.25 hours

2 + 0.5 + x = 5.25

$$x = 5.25 - 2 - 0.5$$
= 2.75
Average speed =  $\frac{198 \text{ km}}{2.75 \text{ h}}$ 
= 72 km/h
Car *P*:

(c) Car *P*:  

$$Time taken = \frac{400 \text{ km}}{80 \text{ km/h}}$$

$$= 5 h$$

Car 
$$Q$$
:  
Speed =  $\frac{200 \text{ km}}{2 \text{ h}}$   
=  $100 \text{ km/h}$   
Time taken =  $\frac{400 \text{ km}}{100 \text{ km/h}}$   
=  $4 \text{ h}$   
Difference in time =  $5 - 4$   
=  $1 \text{ h}$