

P39 1-11 odd, 15-19 odd

$$(1) \text{ speed} = \frac{\text{distance}}{\text{time}} = \frac{235 \text{ km}}{3.25 \text{ h}} = \underline{72.3 \text{ km h}^{-1}}$$

$$(3) \text{ speed} = \frac{\text{distance}}{\text{time}}$$

$$\text{distance} = \text{speed} (\text{time}) = (110 \text{ km h}^{-1}) \left(\frac{2.0 \text{ s}}{3600 \text{ s h}^{-1}} \right) = \underline{0.061 \text{ m}}$$

$$(5) \bar{v} = \frac{\Delta s}{\Delta t} = \frac{-4.2 \text{ cm} - 3.4 \text{ cm}}{6.15 - 3.05} = \underline{-2.45 \text{ cm s}^{-1}}$$



$$\begin{aligned} v &= \frac{s}{t} \\ t &= \frac{s}{v} = \frac{130 \text{ km}}{95 \text{ km h}^{-1}} \\ t &= 1.37 \text{ h} \end{aligned}$$

$$\begin{aligned} t &= 3.33 \text{ h} - 1.37 \text{ h} \\ &= 1.96 \text{ h} \\ s &= vt \\ &= 65 \text{ km h}^{-1} (1.96 \text{ h}) \\ &= 127.4 \text{ km} \end{aligned}$$

(a) $130 \text{ km} + 127.4 \text{ km} = \underline{260 \text{ km}}$

(b) $\text{speed} = \frac{\text{dist}}{\text{time}} = \frac{260 \text{ km}}{3.33 \text{ h}} = \underline{78 \text{ km h}^{-1}}$

(9) 8 leaps (.25 mile) = 2 miles (1.609 km) = 3.218 km = 3218 m
12.5 min (60) = 750 s

(a) $\text{speed} = \frac{\text{dist}}{t} = \frac{3218 \text{ m}}{750 \text{ s}} = \underline{4.3 \text{ m s}^{-1}}$

(b) $\Delta s = 0$ so $\bar{v} = 0$

(11) $v_2 = (95 \text{ km h}^{-1}) 2 = 190 \text{ km h}^{-1}$ relative to tram 1

$$v = \frac{s}{t} \quad t = \frac{s}{v} = \frac{8.5 \text{ km}}{190 \text{ km h}^{-1}} = 0.045 \text{ h} = 2.7 \text{ min}$$

p 39 15-19 odd

$$(15) s = 16.5 \text{ m}$$

$$\text{Sound } s = 16.5 \text{ m}$$

$$v = 340 \text{ ms}^{-1}$$

$$v = \frac{s}{t} \quad t = \frac{s}{v} = \frac{16.5 \text{ m}}{340 \text{ ms}^{-1}} = 0.0485 \text{ s}$$

time for ball to reach pins

$$t = 2.50 \text{ s} - 0.0485 \text{ s} = 2.4515 \text{ s}$$

$$v = \frac{s}{t} = \frac{16.5 \text{ m}}{2.4515 \text{ s}} = \underline{6.7 \text{ ms}^{-1}}$$

$$(17) (a) \bar{a} = \frac{\Delta v}{\Delta t} = \frac{10.0 \text{ ms}^{-1} - 0}{1.35 \text{ s}} = \underline{7.41 \text{ ms}^{-2}}$$

$$(b) \begin{aligned} 10.0 \text{ ms}^{-1} &= 36 \text{ kmh}^{-1} \\ 1.35 \text{ s} &= 3.75 \times 10^{-4} \text{ h} \end{aligned}$$

$$\bar{a} = \frac{36 \text{ kmh}^{-1} - 0}{3.75 \times 10^{-4} \text{ h}} = \underline{9.60 \times 10^4 \text{ kmh}^{-2}}$$

or

$$7.41 \text{ ms}^{-2} \left(\frac{3600^2}{1000} \right) = 9.60 \times 10^4 \text{ kmh}^{-2}$$

$$(19) \begin{aligned} \bar{a} &= \frac{\Delta v}{\Delta t} & \bar{v} &= \frac{\Delta s}{\Delta t} = \frac{110 \text{ m}}{5.0 \text{ s}} = 22 \text{ ms}^{-1} \\ &= \frac{(0 - 22 \text{ ms}^{-1})}{4.0 \text{ s}} \\ &= -5.5 \text{ ms}^{-2} \end{aligned}$$

$$\frac{-5.5 \text{ ms}^{-2}}{9.80 \text{ ms}^{-2}} = \underline{-0.56 g}$$