12.2 CYU

Speed unit = m/s or km/hr

#1 a) $v_{av} = \frac{\Delta d}{\Delta t} = \frac{10m - 0}{5.9s - 0} = \boxed{1.7\ m/s}$

b) $v_{av} = \frac{\Delta d}{\Delta t} = \frac{50m - 40m}{61.2s - 43.0s} = \frac{10m}{18.2s} = \boxed{0.55\ m/s}$

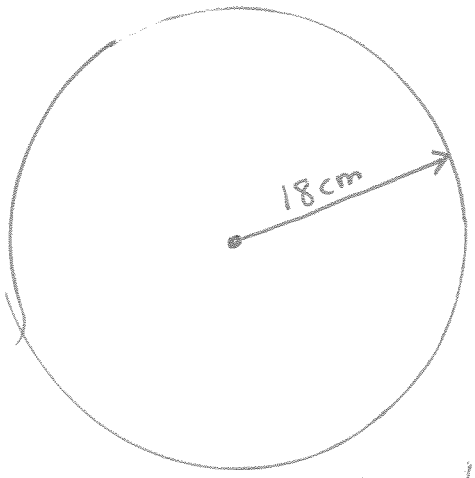
c) $v_{av} = \frac{\Delta d}{\Delta t} = \frac{50 - 0}{61.2 - 0} = \boxed{0.82\ m/s}$

#2 a) $v_{av} = \frac{\Delta d}{\Delta t} = \frac{22 + 34km}{15min + 30min + 25min} = \frac{56km}{60min} \times \frac{60\ min}{1\ hr} = \boxed{56\ km/hr}$

b) $v_{av} = \frac{\Delta d}{\Delta t} = \frac{56km}{35min} \times \frac{60\ min}{1\ hr} = \boxed{96\ km/hr}$

#3 $v_{av} = \frac{250m}{13.1s} = \boxed{19.1\ m/s}$

#4



r = 18cm
C = 2πr
= 113cm

a) 1 min = all the way
= 113cm

b) $113\ cm/min \times \frac{1\ min}{60\ sec} \times \frac{1\ m}{100\ cm}$
$= \boxed{0.0355\ m/s}$

c) No - not smooth, it starts + stops!

#5) $v_{av} = \frac{\Delta d}{\Delta t} \rightarrow 43\ m/s = \frac{75m}{t}$ $\therefore t = \frac{75m}{43\ m/s}$

$= 75m \times \frac{1s}{43m} = \boxed{1.7\ sec}$

#6) $V_{av} = \frac{\Delta d}{\Delta t}$ $\quad 343\,m/s = \frac{150\,m}{t}$ $\quad t = \frac{150\,m}{343\,m/s} = 0.437\,s$ (0.44 s)

$\Delta t = \frac{\Delta d}{V_{av}}$

#7) $V_{av} = \frac{\Delta d}{\Delta t}$ $\quad 90\,m/s = \frac{55\,cm}{t}$ * $\quad 55\,cm \times \frac{1\,m}{100\,cm} = 0.55\,m$

$\therefore 90\,m/s = \frac{0.55\,m}{t}$ $\quad t = \frac{0.55\,m}{90\,m/s} = 0.0061\,sec$

#8) $V_{av} = \frac{\Delta d}{\Delta t}$ $\quad 6.1\,m/s = \frac{\Delta d}{65\,s}$ $\quad \therefore \Delta d = 396.5\,m = 400\,m$

$V_{av} \cdot \Delta t = \Delta d$

#9) $\Delta t \cdot V_{av} = \Delta d$ $\rightarrow$ * $4\,hr + \left(38\,min \times \frac{1\,hr}{60\,min}\right)$ * $\rightarrow 4.63\,hr \times 82\,km/hr$

$4\,hr + .63\,hr = 4.63\,hr$ $\quad = 380\,km$

#10) $\frac{2.5\,m}{sec} \times \frac{1\,km}{1000\,m} = 0.0025\,km/s \times 1\,km = 0.0025\,sec$

#11) $\Delta t \cdot V_{av} = \Delta d$ $\rightarrow$ $15\,sec \times \frac{1\,hr}{3600\,sec} = 0.0042\,hr \rightarrow 0.0042\,hr \times 540\,km/hr$

$= 2.3\,km$

#12) a) $C = 2\pi r$ $\quad = 2\pi \cdot 6700\,km$ $\quad = 42000\,km$

b) $42000\,km \times \frac{1000\,m}{1\,km} = 42{,}000{,}000\,m$

$\Delta t = \frac{\Delta d}{V_{av}} = \frac{42{,}000{,}000}{7800\,m/s} = 5384.61$ $\quad = 5400\,sec$

#13 V_{av} means could be faster or slower at times

V_{const} means always that speed

#14 65 km/h