Solutions

Award method and answer marks as indicated; accept equivalent correct methods.

2.1

- $P = rt = 32 \times 7.5 = \mathbf{240}$ yuan.

2.2

- $t = V/r = 90/12 = \mathbf{7.5}$ minutes.

2.3

- $t = 2 + 36/60 = 2.6$ h; $v = d/t = 156/2.6 = \mathbf{60}$ km/h.

2.4

- $D = P/A = 8400/12 = \mathbf{700}$ people per km^2.

3.1

(a)

- $r = (9/135) \times 100 = \mathbf{20/3}$ litres per 100 km (about 6.67).

(b)

- $F = (9/135) \times 240 = \mathbf{16}$ litres.

(c)

- $t = 3 + 1 = 4$ h; $v = d/t = 240/4 = \mathbf{60}$ km/h.

3.2

(a)

- Convert times to hours and use $v = d/t$.
- $v_1 = 18/(45/60) = \mathbf{24}$ and $v_2 = 12/(40/60) = \mathbf{18}$ km/h.
- The first stage is faster.

(b)

- Total time includes the rest: $t = (45 + 15 + 40)/60 = 5/3$ h.
- $v_{\text{avg}} = 30/(5/3) = \mathbf{18}$ km/h.
- The value 21 simply averages stage speeds and ignores the rest and unequal stage times.

3.3

- Time $= \dfrac{\text{amount}}{\text{rate}} = \dfrac{300}{12}$; this gives **25** minutes.

3.4

(a)

- Density $= \dfrac{\text{mass}}{\text{volume}} = \dfrac{540}{200}$; this gives **2.7** g/cm^3.

(b)

- Mass = density $\times$ volume $= 2.7 \times 350 = \mathbf{945}$ g.