

## Kinematics Terms

$$\textcircled{1} \quad \vec{\Delta d} = (+20) + (-35.7) + (+17) + (-6)$$

$$= -4.7$$

$$\vec{\Delta d} = \boxed{4.7 \text{ km [South]}}$$

$$\textcircled{2} \quad \vec{\Delta d} = \vec{d_f} - \vec{d_i}$$

$$= (-30) - (+100)$$

$$\vec{\Delta d} = \boxed{-130 \text{ cm}}$$

$$\textcircled{3} \quad \text{a) } \vec{\Delta d} = 3.27 + 2.00 - 7.95 + 2.34 - 4.56 + 4.90$$

$$\vec{\Delta d} = \boxed{0}$$

$$\text{b) } 3.27 + 2 = \boxed{5.27} \quad \leftarrow \text{Farthest from 0}$$

$$5.27 - 7.95 = -2.68$$

$$-2.68 + 2.34 = -0.34$$

$$-0.34 - 4.56 = -4.90$$

$$-4.90 + 4.90 = 0$$

$$\textcircled{4} \quad a + b + c = 1.27$$

$$(a+b) + c = 1.27$$

$$a + b = 3.79$$

$$3.79 + c = 1.27$$

$$b + c = -7.82$$

$$c = 1.27 - 3.79$$

$$c = \boxed{-2.52 \text{ km}}$$

(continued on next page)

$$\textcircled{4} \quad a + (b + c) = 1.27$$

$$a + (-7.82) = 1.27$$

$$a = 1.27 + 7.82$$

$$a = \boxed{9.09 \text{ Km}}$$

$$a + b + c = 1.27$$

$$9.09 + b - 2.52 = 1.27$$

$$b = 1.27 + 2.52 - 9.09$$

$$b = \boxed{-5.30 \text{ Km}}$$

$$\textcircled{5} \quad 96 \text{ Km/h} \div 3.6 = \boxed{26.6 \text{ m/s}}$$

$$\textcircled{6} \quad v_{\text{avg}} = \frac{\text{distance}}{\text{time}}$$

$$= \frac{157 \text{ Km}}{2.45 \text{ h}}$$

$$v_{\text{avg}} = \boxed{64.1 \text{ Km/h}}$$

$$\textcircled{7} \quad \text{distance} = v_{\text{avg}} \cdot \text{time}$$

$$= (95 \text{ Km/h}) (3.5 \text{ h})$$

$$d = \boxed{332.5 \text{ Km}}$$

$$\textcircled{8} \quad t = \frac{\text{distance}}{\text{speed}} = \frac{260 \text{ Km}}{104 \text{ Km/h}} = 2.5 \text{ h}$$

Since the drive takes 2.5 h, you can stop for  $\boxed{1.0 \text{ h}}$  for lunch.

⑨

$$d = vt$$

$$= (3 \times 10^8) (2.51)$$

$$d = 753 \ 000 \ 000 \ \text{m} \quad \text{or} \quad \boxed{7.53 \times 10^8 \ \text{m}}$$

⑩

$$a) \quad \Delta v = v_f - v_i$$

$$= 136 - 128$$

$$\Delta v = \boxed{8 \ \text{km/h}}$$

speed

$$\vec{\Delta v} = \vec{v}_f - \vec{v}_i$$

$$= (+136) - (-128)$$

$$= +264$$

$$\vec{\Delta v} = \boxed{264 \ \text{km/h} \ [\text{East}]}$$

velocity

⑪

$$a) \quad \Delta d = -78 + 93 = 15 \ \text{km} \ [\text{North}]$$

$$\vec{v} = \frac{\Delta d}{\Delta t} = \frac{15}{1.22} = \boxed{12.3 \ \text{km/h} \ [\text{North}]}$$

$$b) \quad d = 78 + 93 = 171$$

$$v = \frac{d}{t} = \frac{171}{1.22} = \boxed{140.2 \ \text{km/h}}$$

