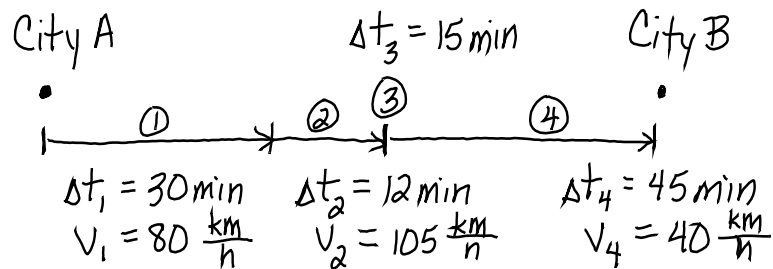


## Chapter 2 Review (cont'd)

- (13) Sally travels by car from one city to another. She drives for 30.0 min at 80 km/h, 12.0 min at 105 km/h, and 45.0 min at 40.0 km/h, and she spends 15.0 min eating lunch and buying gas.



$$v_{\text{avg}} = \frac{\Delta X_{\text{total}}}{\Delta t_{\text{total}}}$$

- (1) Find the total distance travelled,  $\Delta X_{\text{total}}$

$$\Delta t_i (v_i) = \left( \frac{\Delta X_i}{\Delta t_i} \right) \Delta t_i$$

$$\Delta X_1 = v_1 \Delta t_1 = \left( 80 \frac{\text{km}}{\text{h}} \right) \left( \frac{1}{2} \text{ h} \right) = 40 \text{ km}$$

$$\Delta X_2 = v_2 \Delta t_2 = \left( 105 \frac{\text{km}}{\text{h}} \right) \left( \frac{1}{5} \text{ h} \right) = 21 \text{ km}$$

$$\Delta X_4 = v_4 \Delta t_4 = \left( 40 \frac{\text{km}}{\text{h}} \right) \left( \frac{3}{4} \text{ h} \right) = 30 \text{ km}$$

$$\boxed{\Delta X_{\text{total}} = 91 \text{ km}}$$

- (2) Find the total time:  $(30 + 12 + 45 + 15) \text{ min} = 1.7 \text{ h} = \Delta t_{\text{total}}$

$$(3) \quad v_{\text{avg}} = \frac{\Delta X_{\text{total}}}{\Delta t_{\text{total}}} = \frac{91 \text{ km}}{1.7 \text{ h}} = \boxed{53.5 \frac{\text{km}}{\text{h}}}$$