

### Answer on Question #46889-Physics-Other

Sally travels by car from one city to another. She drives for 29.0 min at 67.0 km/h, 52.0 min at 46.0 km/h, and 19.0 min at 76.0 km/h, and she spends 9.0 min eating lunch and buying gas. Determine the average speed for the trip.

#### Solution

Distances traveled are

$$\Delta x_1 = v_1 \Delta t_1 = 67.0 \frac{\text{km}}{\text{h}} \cdot \frac{29.0}{60} \text{ h} = 32.4 \text{ km},$$

$$\Delta x_2 = v_2 \Delta t_2 = 46.0 \frac{\text{km}}{\text{h}} \cdot \frac{52.0}{60} \text{ h} = 39.9 \text{ km},$$

$$\Delta x_3 = v_3 \Delta t_3 = 76.0 \frac{\text{km}}{\text{h}} \cdot \frac{19.0}{60} \text{ h} = 24.1 \text{ km}.$$

Thus, the total distance traveled is  $x = \Delta x_1 + \Delta x_2 + \Delta x_3 = 32.4 \text{ km} + 39.9 \text{ km} + 24.1 \text{ km} = 96.4 \text{ km}$ , and the elapsed time is  $\Delta t = \frac{29.0+52.0+19.0+9.0}{60} = 1.8 \text{ h}$ .

The average speed for the trip is

$$\bar{v} = \frac{\Delta x}{\Delta t} = \frac{96.4 \text{ km}}{1.8 \text{ h}} = 53.6 \frac{\text{km}}{\text{h}}.$$

**Answer:  $53.6 \frac{\text{km}}{\text{h}}$ .**