A person travels by car from one city to another. She drives for 28.2 min at 73.8 km/h, 9.9 min at 105 km/h, 49.3 min at 47 km/h, and spends 10.3 min along the way eating lunch and buying gas. Determine the distance between the cities along this route. Answer in units of km

Solution

At the first step of the way she moved with speed 73.8 km/h for 28.2 min and traveled the distance:

$$d_1 = 73.8\frac{km}{h} * 28.2 \text{ min} = 73.8\frac{km}{h} * \frac{28.2}{60} \text{ h} = 34.686 \text{ km}.$$

At the second step of the way she moved with speed 105 km/h for 9.9 min and traveled the distance:

$$d_2 = 105\frac{km}{h} * 9.9 \text{ min} = 105\frac{km}{h} * \frac{9.9}{60} \text{ h} = 17.325 \text{ km}.$$

At the third step of the way she moved with speed 47 km/h for 49.3 min and traveled the distance:

$$d_3 = 47\frac{km}{h} * 49.3 \text{ min} = 47\frac{km}{h} * \frac{49.3}{60} \text{ h} = 38.618 \text{ km}.$$

At the fourth step of the way she didn't move, so the distance $d_4 = 0 \ km$.

The distance between the cities along this route:

$$d = d_1 + d_2 + d_3 + d_4 = 34.686 \text{ km} + 17.325 \text{ km} + 38.618 \text{ km} + 0 \ km = 90.629 \ km.$$

Answer: 90.629 km.