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This is a 1-D problem involving average speed

A delivery truck travels up a hill at a constant speed of 50 km/h , in order to deliver a package. After the package is delivered, the truck travels down the same hill at 80 km/h . What is the average speed of the truck for the round trip?

Solution:

The equation for average speed is: $\bar{v} = \frac{\text{total dist.}}{\Delta t}$

Let D be the distance up the hill.
This distance is travelled in a time

$$\Delta t_1 = \frac{D}{50} \quad (\text{for constant speed up the hill})$$

The distance down the hill is also equal to D .
This distance is travelled in a time

$$\Delta t_2 = \frac{D}{80} \quad (\text{for constant speed down the hill})$$

The total distance travelled is $D + D = 2D$.

The total time for the round trip is

$$\Delta t_1 + \Delta t_2 = \frac{D}{50} + \frac{D}{80} = \Delta t$$

Therefore, the average speed is, $\bar{v} = \frac{2D}{\frac{D}{50} + \frac{D}{80}}$
 D cancels out, so

$$\bar{v} = \frac{2}{\frac{1}{50} + \frac{1}{80}} = 61.5 \text{ km/h} \quad (\text{answer})$$