



SPEED



Peter drives at a constant speed of 90 km/h to his office every morning.

He drives at a constant speed of 70 km/h back home every evening.

What is his average speed for the round-trip?



ANSWER TO

SPEED

Let d be the distance.

$$\text{Time taken to drive to office} = \frac{d}{90}$$

$$\text{Time taken to drive back home} = \frac{d}{70}$$

$$\begin{aligned}\text{Total time taken} &= \frac{d}{90} + \frac{d}{70} \\ &= \frac{7d}{630} + \frac{9d}{630} \\ &= \frac{16d}{630} \\ &= \frac{8d}{315}\end{aligned}$$

$$\text{Total distance covered} = d + d = 2d$$

$$\begin{aligned}\text{Average speed} &= 2d \div \frac{8d}{315} \\ &= 2d \times \frac{315}{8d} \\ &= \frac{315}{4} \\ &= 78\frac{3}{4} \text{ km/h}\end{aligned}$$

