

Speed and Averages

Question 1

Answer: A, 875m

According to the diagram, we can see that the linear distance from Nikki's house to Rachel's house is 1.25km.

$$1.25\text{km} = 1250\text{m}$$

Since $3 + 7 = 10$, each unit of ration is $1250 \div 10 = 125\text{m}$

The distance from The Donut Shop to Rachel's house = $125\text{m} \times 7$
= 875m

Thus, the answer is A, 875m.

Question 2

Answer: B, 2 minutes early

According to the diagram, the direct route from Rachel's house to the school is 950m long.

$$4.5\text{km/hr} = 4500\text{m/hr}$$

Total time taken for Rachel to walk to school = $(950\text{m}/4500\text{m/hr}) \times 60$ minutes

$$= 12.67 \text{ minutes}$$

$$\approx 13 \text{ minutes}$$

Time Rachel will arrive at school = $8:15\text{am} + 13 \text{ minutes}$
= 8:28am

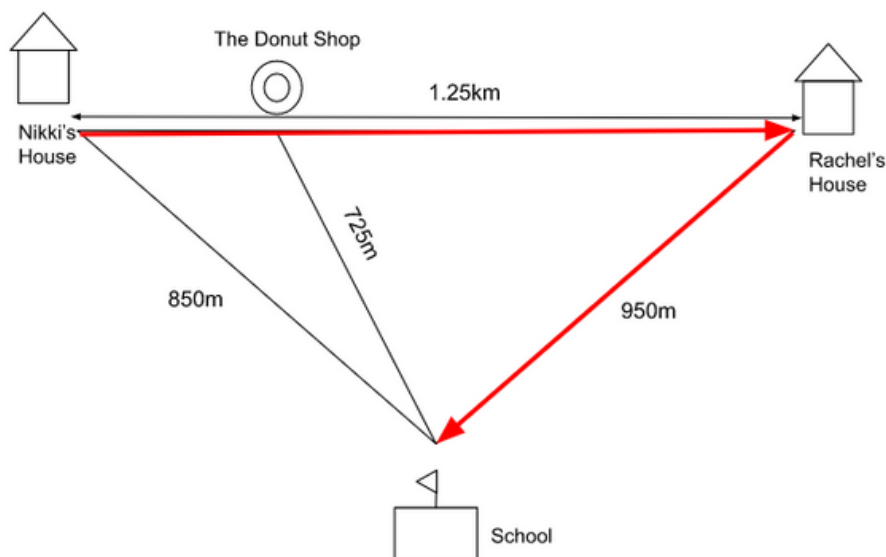
Thus, Rachel will be 2 minutes early.

Speed and Averages

Question 3

Answer: E, 3.13 minutes

According to the diagram, the shortest distance travelled by Nikki would be:



$$\begin{aligned} \text{Time taken from Nikki's house to Rachel's house} &= \frac{1.25\text{km}}{50\text{km/hr}} \times 60 \text{ minutes} \\ &= 1.5 \text{ minutes} \end{aligned}$$

$$\begin{aligned} \text{Time taken from Rachel's house to the school} &= \frac{0.95\text{km}}{35\text{km/hr}} \times 60 \text{ minutes} \\ &= 1.6285... \text{ minutes} \\ &\approx 1.63 \text{ minutes} \end{aligned}$$

$$\begin{aligned} \text{Total time} &= 1.5 + 1.63 \\ &= 3.13 \text{ minutes} \end{aligned}$$

Thus, the answer is E.

Speed and Averages

Question 4

Answer: D, 7:59 am

$$\begin{aligned}\text{Total Distance traveled by Nikki} &= 300\text{m} + 725\text{m} \\ &= 1025\text{m} \\ &= 1.025\text{km}\end{aligned}$$

$$\begin{aligned}\text{Time for Nikki to get to school} &= \frac{1.025\text{km}}{10.25\text{km/hr}} \times 60 \text{ minutes} + 5 \text{ minutes} \\ &= 11 \text{ minutes}\end{aligned}$$

$$\begin{aligned}\text{Time that Nikki arrives at school} &= 8:00 \text{ am} + 11 \text{ minutes} \\ &= 8:11 \text{ am}\end{aligned}$$

According to the diagram, the direct route from Rachel's house to the school is 950m long.

$$\begin{aligned}\text{Time for Rachel to get to school} &= \frac{950\text{m}}{4750\text{m/hr}} \times 60 \text{ minutes} \\ &= 12 \text{ minutes.}\end{aligned}$$

For Rachel to arrive at school at 8:11 am, she needs to leave home at 8:11 am - 12 minutes = 7:59 am.

Thus, the answer is D, 7:59 am.