

Paula rode her bicycle a total of 60 kilometers in a 4 hour marathon. She passed the front rider after 12 minutes into the race. If her speed was constant throughout the race, how many meters did she ride before she passed the front rider?

Solution

Let's find the velocity of the bicycle (we know that it's constant):

$$v = \frac{S}{t} = \frac{60 \text{ kilometers}}{4 \text{ hour}} = \frac{60 * 1000 \text{ m}}{4 * 60 * 60 \text{ s}} = 4.167 \frac{\text{m}}{\text{s}}$$

where S is a length of marathon, t is a time of marathon.

She ride before she passed the front rider X :

$$X = v * t_1 = 4.167 \frac{\text{m}}{\text{s}} * 12 \text{ minutes} = 4.167 * 12 * 60 = 3000 \text{ m} = 3 \text{ km}$$

where t is time she passed the front rider.

Answer: 3 km.