

Answer on Question 73217, Physics, Other

Question:

The school bus picks up Brian in front of his house and takes him on a straight-line 2.9 km bus ride to school in the positive direction. He walks home after school. If the front of Brian's house is the origin, (a) what is the position of the school, (b) what is his displacement on the walk home, and (c) what is his displacement due to the combination of the bus journey and his walk home?

Solution:

a) Let's the front of Brian's home be the initial position (the origin), $x_i = 0 \text{ km}$. Then, the final position (the position of the school) will be $x_f = 2.9 \text{ km}$.

b) By the definition, the displacement is the change in the position of the object:

$$\text{Displacement} = \Delta x = x_f - x_i,$$

here, Δx is the displacement, $x_f = 0 \text{ km}$ – is the final position of the Brian(because he walks to home), $x_i = 2.9 \text{ km}$ is the initial position of the Brian.

Then, from this formula we can find his displacement on the walk home:

$$\text{Displacement} = \Delta x = x_f - x_i = 0 \text{ km} - 2.9 \text{ km} = -2.9 \text{ km}.$$

c) Because Brian returns to the original position, his displacement due to the combination of the bus journey and his walk home is equal to zero.

Answer:

a) $x_f = 2.9 \text{ km}$.

b) $\Delta x = -2.9 \text{ km}$.

c) $\Delta x = 0 \text{ km}$.