

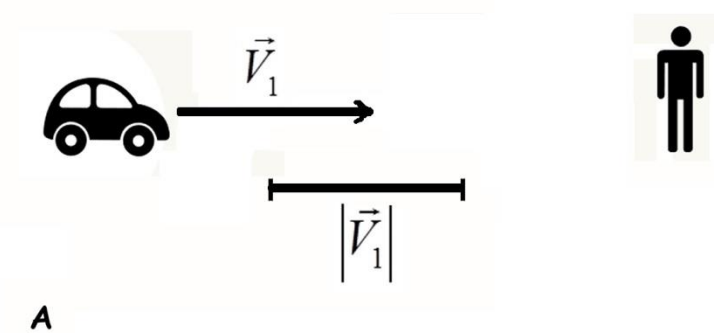
Answer on Question #61590, Physics / Mechanics | Relativity

Using illustrations, explain why a car moves faster to a pedestrian moving in opposite direction than to a bystander

Solution:

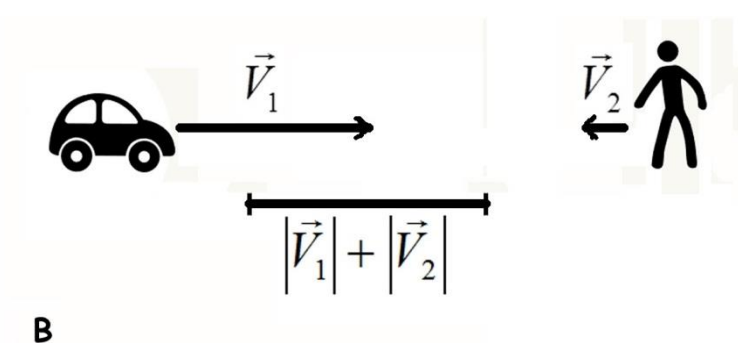
If the observer is standing on the roadside, then the value of the car speed relative to the observer equals the magnitude of the car velocity relative to the road.

$$V = |\vec{V}_1|$$



If the observer is moving towards the car, then the value of the car speed relative to the observer equals the sum of the magnitudes of the car velocity relative to the road and the observer velocity relative to the road.

$$V = |\vec{V}_1| + |\vec{V}_2|$$



The approaching speed for observer and car in case B is more than speed in case A by the value $|\vec{V}_2|$, so it seems to the observer that the car is moving faster.