

Answer on Question # 84405, Physics / Mechanics | Relativity

Question 1. *With what constant velocity v must a person travel from the centre to the edge of our galaxy in order to cover the distance of $d = 3 \cdot 10^4$ light years in $t = 40$ years?*

Solution.

$d = 3 \cdot 10^4 \text{ l.y.} \approx 2.84 \cdot 10^{20} \text{ m}$ and $t = 40 \text{ y} \approx 1.26 \cdot 10^9 \text{ s}$.

$$v = \frac{d}{t} = \frac{2.83 \cdot 10^{20} \text{ m}}{1.26 \cdot 10^9 \text{ s}} \approx 2.25 \cdot 10^{11} \text{ m/s} \approx 749.2 c,$$

where $c = 299792458 \text{ m/s}$ is the speed of light in vacuum. □