

Answer on Question #71297, Physics / Mechanics — Relativity

Question A body moves in the southern direction for 10s at the speed of 10m/s. It then starts moving in the Eastern direction at the speed of 20m/s for 10s. The magnitude of the average velocity is

Solution Let us find total displacement. The directions of first and second movement are perpendicular, hence,

$$L = \sqrt{L_1^2 + L_2^2} = \sqrt{v_1^2 t_1^2 + v_2^2 t_2^2} \approx 223.6$$

Total time is

$$t = t_1 + t_2 = 10 + 20 = 30 \text{ s}$$

The magnitude of average velocity is

$$v = \frac{L}{t} = \frac{223.6}{30} \approx 7.45 \text{ m/s}$$