



Problem of the Week

Problem B and Solution

Into the Wild Blue Yonder!

Problem

Canadian Actor William Shatner travelled on the Blue Origin rocket in October 2021. He was in the rocket for 10 minutes and 17 seconds after liftoff, before landing back on the desert floor in Texas. The rocket rose to an altitude of 105.9 km.

- If his flight was straight up and down, what was his mean speed, to the nearest kilometre per hour, over the course of the whole journey?
- The length of the Trans-Canada Highway between the east and west coasts of Canada is 7821 km. If the rocket travels a distance of 7821 km at the mean speed found in part (a), approximately how long (in hours and minutes) would that trip take?



Solution

- The total distance William Shatner travelled was $105.9 \times 2 = 211.8$ km.

His travel time was 10 minutes and 17 seconds. Since there are 60 seconds in one minute, his travel time was $10 \times 60 + 17 = 617$ seconds. Since there are $60 \times 60 = 3600$ seconds in each hour, his travel time in hours was $617 \div 3600 \approx 0.1714$ hr.

Thus, his mean speed was $211.8 \text{ km} \div 0.1714 \text{ hr} \approx 1236 \text{ km/hr}$.

- Travelling a distance of 7821 km at a mean speed of 1236 km/hr would take the rocket $7821 \div 1236 \approx 6.328$ hr. Since there are 60 minutes in each hour, this is equal to $6.328 \times 60 \approx 380$ minutes, or approximately 6 hours and 20 minutes.

NOTE: Calculations here were carried out with four significant digits. Answers may vary if fewer are used at each stage.