Answer on Question #62482 – Physics – Molecular Physics – Thermodynamics

Question:

An astronaut has a centripetal acceleration of $2.34\ x\ 10^2\ \frac{m}{s^2}$. What is the velocity of the astronaut at $6.78\ x\ 10^6$ meters above the surface of Earth?

Answer:

$a = \omega^2(R_\oplus + h) = \frac{v^2}{R_\oplus + h} \Rightarrow v = \sqrt{a(R_\oplus + h)} = 55.47 \cdot 10^3\ \frac{m}{s}$;

Velocity of the astronaut at $6.78\ x\ 10^6$ meters above the surface of Earth is $55.47 \cdot 10^3\ \frac{m}{s}$.