Answer on Question #56599-Physics-Mechanics-Relativity

5-12 A diver makes 2.5 complete revolutions on the way from a 10 m high platform to the water below. Assuming zero initial vertical velocity, calculate the average angular velocity during a dive.

Ans. [11 rad/s]

Solution

$$\omega_{avg} = \frac{\theta}{t}.$$

$$h = \frac{gt^2}{2} \rightarrow t = \sqrt{\frac{2h}{g}}$$

$$\omega_{avg} = \frac{\theta}{\sqrt{\frac{2h}{g}}} = \frac{2.5\frac{rev}{1} \cdot rad}{\sqrt{\frac{2 \cdot 10\,m}{9.8\frac{m}{s^2}}}} = 11\frac{rad}{s}.$$