Question 69184 – Physics/Mechanics/Relativity

A porpoise jumps straight up and crashes back into the water at 8.9 m/s. The drag and buoyancy forces of the water slow the porpoise down with an acceleration of -9.3 m/s^2 as the porpoise finally slows to a stop. Find the depth the porpoise reaches.

Answer:

The negative acceleration affects stop of a body after traveling of S length:

$$S = \frac{v^2 - v_0^2}{2a} = -\frac{v_0^2}{2a} = -\frac{8.9^2 \left(\frac{m}{s}\right)^2}{-2 \cdot \frac{9.3m}{s^2}} = 4.3\ m$$

The depth reaches is 4.3 meters.