

Chapter 2 Problem 25 †

Given

$$t = 1.12 \text{ s}$$

$$v = 11.0 \text{ m/s}$$

Comes to a stop in 0.131 s

Solution

Find the acceleration while falling and deceleration while stopping.

While falling the acceleration is

$$\bar{a} = \frac{\Delta v}{\Delta t} = \frac{v_f - v_i}{t_f - t_i} = \frac{11.0 \text{ m/s} - 0 \text{ m/s}}{1.12 \text{ s} - 0 \text{ s}} = 9.82 \text{ m/s}^2$$

While stopping the acceleration is

$$\bar{a} = \frac{\Delta v}{\Delta t} = \frac{v_f - v_i}{t_f - t_i} = \frac{0 \text{ m/s} - 11.0 \text{ m/s}}{0.131 \text{ s} - 0 \text{ s}} = -84.0 \text{ m/s}^2$$

The negative sign indicates that the egg is slowing down or decelerating.

†Problem from Essential University Physics, Wolfson