

Chapter 6 Problem 17[†]

Given

$$\Delta x = 75 \text{ cm} = 0.75 \text{ m}$$

$$W = 140 \text{ MJ} = 1.40 \times 10^8 \text{ J}$$

Solution

Find the average force as the meteorite hits the ground.

From the definition of work.

$$W = F\Delta x$$

Solving for the average force gives

$$F = \frac{W}{\Delta x} = \frac{1.40 \times 10^8 \text{ J}}{0.75 \text{ m}} = 1.87 \times 10^8 \text{ N}$$

$$F = 187 \text{ MN}$$

[†]Problem from Essential University Physics, Wolfson