

Module 07 - Lesson 3

Variable Forces and Impulse

Question 1: What impulse does the force shown in Fig. 1 exert on a 1-kg particle in the 6 seconds interval?

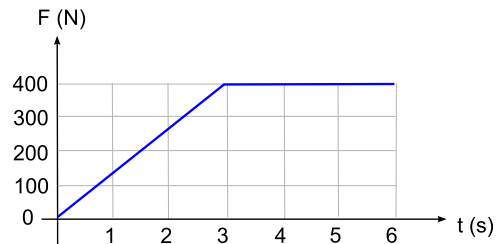


FIG. 1: A time-varying force.

Question 2: A spring with spring constant $k = 400$ N/m is stretched gradually to a length $\Delta x = 5$ cm in 2 s. Assuming the stretch has a linear time dependence $x(t) = (0.025 \text{ m/s})t$ during the 2-s interval, find the impulse experienced by the spring due to the stretching force?

Problem: The thrust force on a rocket is given by $F(t) = c(t - 3\text{s})$, where $c = 3.2 \text{ N/s}^2$. Calculate the total impulse experienced by the rocket over the burning period from $t = 0$ to $t = 3$ s.