Answer on Question #71926-Physics-Mechanics-Relativity

A sliding mechanism in a machine moves with a velocity given by the expression:

$v = 7t + 0.8t^2$ mm/s

Calculate the displacement that occurs between t=2 and t=4 seconds

Solution

The displacement that occurs between t=2 and t=4 seconds is

$$d = \int\limits_2^4 v(t)dt$$

$$d = \int\limits_2^4 (7t + 0.8t^2)dt = \left(\frac{7t^2}{2} + \frac{0.8t^3}{3}\right)\Bigg|_2^4 = \left(7\frac{4^2}{2} + 0.8\frac{4^3}{3}\right) - \left(7\frac{2^2}{2} + 0.8\frac{2^3}{3}\right) = 57 \; mm = 0.057 \; m.$$

Answer: 0.057 m.