

Answer on Question #52849, Physics – Mechanics Kinematics | Dynamics

Question:

The velocity of an object is given by the formula

$$v=2t^2+4t+2$$

Use intergration to calculate the distance travelled between t=4s and t=7s

Answer:

$$\begin{aligned}\int_4^7 2t^2 + 4t + 2 dt &= \frac{2t^3}{3} + 2t^2 + 2t \Big|_4^7 = \frac{2 \times 7^3}{3} + 2 \times 7^2 + 2 \times 7 - \left(\frac{2 \times 4^3}{3} + 2 \times 4^2 + 2 \times 4 \right) \\ &= \frac{686}{3} + 98 + 14 - \frac{128}{3} - 32 - 8 = 186 + 72 = 258\end{aligned}$$