

Average Rate of Change (ARC)

Ex1:

A particle moves in a straight line, according to the eq-n $d(t) = -2t^3 + 5t - 1$, where d is the displacement, in meters, t seconds into motion.

Determine the ARC of $d(t)$ between the 3rd and the 7th seconds.

$$\text{ARC}_{[3,7]} = \frac{d(t_2) - d(t_1)}{t_2 - t_1} = \frac{d(7) - d(3)}{7 - 3}$$

$$d(7) = -2(7)^3 + 5(7) - 1 = -652$$

$$d(3) = -2(3)^3 + 5(3) - 1 = -40$$

$$\text{ARC}_{[3,7]} = \frac{-652 - (-40)}{7 - 3} = \frac{-652 + 40}{4} = \frac{-612}{4} = -153 \frac{\text{m}}{\text{s}}$$