Example

The revenue (in thousands of dollars) from producing x units of Alpha axles is

$$R(x) = 10x - 0.002x^2.$$

What is the average rate of change of revenue when production is increased from 1000 to 1001 units?

Example

The spread of the new Bravo bird flu can be predicted quite accurately. After t days in a population (for $0 \leq t \leq 5$), the percentage of the population that will be infected is given by

$$p(t) = t^2 + t.$$

Find the average rate of change of p with respect to t over the interval from 1 to 4 days.

Example

Recall that the revenue (in thousands of dollars) from producing x units of Alpha axles is

$$R(x) = 10x - 0.002x^2.$$

What is the instantaneous rate of change of revenue when production is 1000 units?

How does this compare with the average rate of change computed earlier?

Example

Recall that after t days in a population (for $0 \leq t \leq 5$), the percentage of the population that will be infected by the Bravo bird flu is

$$p(t) = t^2 + t.$$

Find the instantaneous rate of change of p with respect to t at $t = 3$.

Example

Suppose the position of an object moving in a straight line is given by

$$s(t) = t^3 + 2t + 9.$$

(a) Find the instantaneous velocity at $t = 1$.

(b) Find the instantaneous velocity at $t = 4$.