Math 220 - Calculus f. Business and Management - Worksheet 18

Worksheet 18 - Rates and the Mean Value Theorem

Average rate of change over an interval

Exercise 1: *Find the average rate of change for each function over the given interval*

1a : $f(t) = -3t^2 + 32t + 100$ *from* $t = 1$ *to* $t = 4$,

1b : $f(x) = \sqrt{x}$ *from* $x = 1$ *to* $x = 64$,

1c : $f(w) = e^w$ *from* $w = 2$ *to* $w = 5$ (use a calculator to get an approximate answer),

1d : $f(q) = \log_3 q$ *from* $q = 1$ *to* $q = 81$.

Instantaneous rate of change

Exercise 2: *For the functions in excercise 1, compute their instantaneous rate of change at the given point:*

2a : $f(t) = -3t^2 + 32t + 100 :$ $t = 4$,

2b : $f(x) = \sqrt{x} :$ $x = 25$,

2c : $f(w) = e^w :$ $w = 3$ (use a calculator to get an approximate answer),

2d : $f(q) = \log_3 q :$ $q = 9$.

Mean Value Theorem

Exercise 3: *Given is* $f(x) = \sqrt[3]{x}$. *Find the point at which the instantaneous rate of change of* $f(x)$ *equals its average rate of change from x = 1 to x = 8.*