MATH 373: CLASS 15

1. Exercise

1) In section 4.1 we learnt how to derive the approximation formula for $f'(x_0)$.

This problem will guide you to derive the approximation formula for $f''(x_0)$.

a) Write the third degree Taylor polynomial of $f(x)$ about $x = x_0$.

b) In stead of substitute h by $-h$ in a).

c) Add the equation in part a) and b) to get rid of $f'(x_0)h$ term.

d) Solve the equation in term of $f''(x_0)$.

2) Assume $M = N(h) + K_1 * h + K_2 * h^2 + K_3 * h^3 + ...$

Given $N(h) = 1.040810, N(\frac{h}{2}) = 1.020201, N(\frac{h}{4}) = 1.01005$. Find $N_3(h)$.

(This problem I tried to approximate the value of $f(x) = e^x$ at $x = 0$ by using the value of $f(0.04), f(0.02)$ and $f(0.01)$. $N_3(h)$ supposed to be really closed to 1).

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