Assignment-2

CS21B061
Shaji Ur Rahman
Khan

Ques) Given, $f(x) = 10x^2 - 34x + 45$

now, $f'(x) = 20x - 34$

$f''(x) = 20$

a/c Newton Raphson method for minimisation :-

$$x^{new} = x^{old} - \left.\frac{f'(x)}{f''(x)}\right|_{x^{old}}$$

for guessing, let $x_0 = 0$

$$\Rightarrow x_1 = x_0 - \left.\frac{f'(x)}{f''(x)}\right|_{x_0}$$

$$x_1 = 0 - \left.\frac{20x-34}{20}\right|_{x_0} = 0 - \left(\frac{-34}{20}\right) = \frac{34}{20}$$

$$f'(x) = (20x-34)\big|_{x_1} = 20\left(\frac{34}{20}\right) - 34 = 0$$

thus x is the value at which $f(x)$ has minimum value.

$\Rightarrow$ $\boxed{x = \frac{34}{20} = 1.7}$ & $\boxed{\text{starting point } x_0 = 0}$