Assignment-2

Iteration 1:

$\eta = 0.001$, $f(x) = x^4 + 3x^2 + 10$, Let $x = 5$

Gradient at $x = 5$

$$\frac{\partial f(x)}{\partial x} = 4x^3 + 6x \Rightarrow 4(5)^3 + 6(5) = 530$$

$$\Delta x = -0.001 \times 530 = 0.53$$

$$x = 5 - 0.53 = +4.47$$

Iteration 2:

Gradient at $x = +4.47$

$$\frac{\partial f(x)}{\partial x} \bigg|_{x=4.47} = 4(4.47)^3 + 6(4.47) = 384.07$$

$$\Delta x = -0.001 \times 384.07 = -0.38407$$

$$x = 4.47 - 0.38407$$

$$= -4.085$$