Assignment-2

$f(x) = x^4 + 3x^2 + 10$

Iteration 1)

Let us take $x = 3$ and $\eta = 0.01$

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

$$\frac{\partial f}{\partial x}\Big|_{x=2} = 4(2)^3 + 6(2)$$

$$= 32 + 12$$

$$= 44.$$

as gradient not near to zero,

$$\Delta x = -\eta \frac{\partial f}{\partial x}$$

$$= -0.01(44) = -0.44$$

update x values as $x = 2 - 0.44$

$$= 1.56$$

Iteration 2)

Let us take $x = 1.56$

$$\frac{\partial f}{\partial x} = 4x^3 + 6x$$

$$= 4(1.56)^3 + 6(1.56)$$

$$= 24.546$$

$$\Delta x = -0.01 \times (24.546) = -0.245$$

update x value as

$$x = 1.56 - 0.245$$

$$= 1.315$$