ASSIGNMENT - 1

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Find the global minimum point and value for the function $f(x) = x^4 + 3x^2 + 10$

- Do calculations for 2 iterations.

Solt

Step 1 : $x = 2$, epochs = 2, $n = 0.1$, itr = 1

Step 2 : $\frac{df}{dx} = 4x^3 + 6x$

$\Rightarrow 4(2)^3 + 6(2) = 44$

Step 3 : $\Delta x = -n \frac{df}{dx}$

$= -0.1 \times 44 = -4.4$

Step 4 : $x = x + \Delta x$

$= 2 - 4.4 = -2.4$

Step 5 : itr = itr + 1

$= 1 + 1 = 2$

Step 6 : if $(2 > 2)$

false

Go to step 2.

Step 2 : $\frac{df}{dx} = 4x^3 + 6x$

$\Rightarrow 4(-2.4)^3 + 6(-2.4) = -69.69$

Step 3 : $\Delta x = -n \frac{df}{dx}$

$= -0.1 \times -69.69 = 6.9$

Step 4 : $x = x + \Delta x$

$= -2.4 + 6.9 = 4.5$

Step 5 : $itr = itr + 1$

$= 2 + 1 = 3$

Step 6 : if $(3 > 2)$

true.

$\therefore x = 4.5$