Assignment-1

9).

Given equation x^4+3x^2+10.

$\min f(x) = x^4+3x^2+10$ → optimisation problem

step1: x^4+3x^2+10.

epochs = 2

$x = 2$

$\eta = 0.1$

step2: $\frac{\partial f}{\partial x} = 4x^3+6x$

$= 4(2)^3+6(2)$

$= 32+12$

$= 44$

step3: $\Delta x = -\eta\frac{\partial f}{\partial x}$

$= -(0.1)(44)$

$= -4.4$

step4: $x = x+\Delta x$

$= 2+(-4.4)$

$= -2.4$

step5: iter = iter+1

$= 1+1$

$= 2$

step6: if(2>2)

↳ False move to step2

Step2: $\frac{\partial f}{\partial x} = 4x^3 + 6x$

$= 4(-2.4)^3 + 6(-2.4)$

$= -55.296 + (-14.4)$

$= -69.696.$

Step3: $\Delta x = -\eta \frac{\partial f}{\partial x}$

$= -(0.1)(-69.696)$

$= 6.9696.$

Step4: $x = x + \Delta x$

$= (-2.4) + 6.9696$

$= 4.5696$

Step 5: iter = iter + 1

$= 2 + 1$

$= 3$

Step6: if $(3 > 2)$

↳ True.

Step7: $x = -2.4$

$f(x) = (-2.4)^3 + 3(-2.4)^2 + 10.$