Find the minimum value of $f(x)= x^4 + 3x^2 + 10$

Manual calculation:

<u>Iteration 1:</u>

Let x = 2 and $\eta = 0.011$

Gradient at x = 2 $df(x)/dx \mid_{x=2} = 4(2)^3 + 6(2) = 32 + 12 = 44$

$\Delta x = -0.01 * 44 = -0.44$

Update x value as $x = 2 – 0.44 = 1.56$

<u>Iteration 2:</u>

Gradient at x = 1.56 $df(x)/dx \mid_{x=2} = 4(1.56)^3 + 6(1.56) = 24.54$

$\Delta x = -0.01 * 24.54 = -0.2454$

Update x value as $x = 1.56 – 0.2454 = 1.31$

This process repeats until gradient is near to zero.