Assignment - 2

$f(x) = x^4 + 3x^2 + 10$ at $x = 0$, $f(x) = 10$

iteration 1

↳ let $x = 2$ and $\eta = 0.01$

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

$= 32 + 12 = 44$

as gradient not near to zero,

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

$$= -0.01\,(44) \Rightarrow -0.44$$

update x as $x = 2 - 0.44 = 1.56$

iteration - 2

↳ let $x = 1.15$, $\frac{\partial f}{\partial x}\Big|_{x=1.5}$ $\quad = 4(1.5)^2 + 6(1.5)$

$= 13.5 + 9$

$= 22.5$

$$\Delta x = -0.01(22.5) \Rightarrow -0.225$$

update $x = 1.5 - 0.225 = 1.275$