Assignment - 3

$$f(x) = 3x^2 + 5e^{-y} + 10$$

Iteration 1:

1) Choose initial value for x, y and η

$x = 2$, $y = 3$ and $\eta = 0.01$.

2) Find gradient at $x=2$ i.e $\left.\frac{\partial f(x,y)}{\partial x}\right|_{x=2}$

$= 6(2) = 12$

3) Find gradient at $y=3$ i.e $\left.\frac{\partial f(x,y)}{\partial y}\right|_{y=3}$

$= -5e^{-y}$

$= -5e^{-3} = -5 \times 0.0497$

$= -0.2489$

4) As gradient not near to zero, calculate step length $\Delta x = -0.01 * 12 = -0.12$

$\Delta y = -0.01 * (-0.2489) = 0.002489$

5) Update x value as $x = 2 - 0.12 = 1.88$

and $y = 3 + 0.002489 = 3.002489$

This procedure is repeating until gradient is near to zero for the next iteration

$x = 1.88$ and $y = 3.002489$.