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

iteration 1

Let $x=1 \quad y=2 \quad n = 0.01$

At $x=1$

$$\frac{df(x,y)}{d(x)} = 6(1) = 6$$

At $y=2$

$$\frac{df(x,y)}{d(y)} = -5e^{-(2)} = -0.676676416\overline{18}$$

$$\Delta x = -(0.01)(6) = -0.06$$

$$\Delta y = -(0.01)(-0.676676416\overline{18}) = -0.\overline{00}676676416\overline{18}$$

$$x = 1 - 0.06 = 0.94$$

$$y = 2 + 0.\overline{00}676676416\overline{18} \simeq 2.\overline{00}676676416\overline{18}$$

$$\simeq 2.007.$$

$x = 0.94 \quad y = 2.007.$

Iteration 2

At $x = 0.94$

$$\frac{df(x,y)}{d(x)} = 6(0.94) = 5.64$$

At $y = 2.007$

$$\frac{df(x,y)}{d(y)} = -5 * e^{-2.007} = -5(0.134) = -0.671$$

$$\Delta x = -0.01 * 5.64 = -0.056$$

$$\Delta y = -0.01 * -0.6751 = 0.00671.$$

$$x = 0.94 - 0.056 = 0.88.$$

$$y = 2.007 + 0.00671 = 2.014$$