assignment - 3:

$f(x,y) = 3x^2 + 5e^y + 10.$

① $\eta = 0.1 \quad x=2, \quad y=3$

• at $x=2 \quad m_1 = \left.\frac{df(x,y)}{dx}\right|_{x=2}$

• $\Delta x = 6x\big|_{x=2} = 6(2) = 12$

• $m_2 = \left.\frac{df(x,y)}{dy}\right|_{y=3}$

$\Delta y = 5e^{-y} = 5e^{-3} = 0.2489$

• $\Delta x = -0.1(12) = -1.2$

• $\Delta y = -0.1(0.2489) = -0.02489$

• $x = 2 - 1.2 = 1.8 \quad y = 3 - 0.02489 = 2.97$

$m_1 = \frac{df(x,y)}{dx} = 6(1.8) = 10.8$

$m_2 = \frac{df(x,y)}{dy} = 5e^{-(2.97)} = 0.25651$

$\Delta x = -0.1(10.8) = -1.08$

$\Delta y = -0.1(0.25651) = -0.025651$

• $x = 1.8 - 1.08 = 0.72$

• $y = 2.97 - 0.0256 = 2.944$

$m_1 = \frac{df(x,y)}{} = 6(0.72) = 4.32$

$m_2 = \frac{df(x,y)}{dy} = 5e^{-(2.944)} = 0.26327$

This repeates until gradient is near to zero.