① Given that, $f(x,y) = 3x^2+1$, $x_0=1$, $y_0=2$ & $h=0.5$

$x_1 = x_0 + h = 1 + 0.5 = 1.5$, $x_2 = x_0 + 2h = 1 + 2\times0.5 = 2$

$x_3 = x_0 + 3$.

By eulars Formulla, $y_n = y(x_n) = y_{n-1} + hf(x_{n-1}, y_{n-1})$

$n=1$, $y_1 = y(x_1) = y(1.5) = y_0 + hf(x_0, y_0)$.

$= y_0 + h(3x_0^2+1)$

$= 2 + 0.5(3.(1)^2+1)$

$y(1.5) = 4$

$n=2$, $y_2 = y(x_2) = y(2) = y_1 + hf(x_1, y_1)$

$= 4 + 0.5\times(3\times1.5^2+1)$

$y(2) = 7.875$

When $h = 0.25$, $x_1 = x_0 + h = 1 + 0.25 = 1.25$

$x_2 = x_0 + 2h = 1 + 2\times0.25 = 1.5$

$x_3 = x_0 + 3h = 1 + 3\times0.25 = 1.75$

$x_4 = x_0 + 4h = 1 + 3\times0.25 = 2.$

$n=1$, $y_1 = y(x_1) = y(1.25) = y_0 + h(3\times0^2+1) = 2 + 0.25\times(3\times1^2+1)$

$y_1 = y(1.25) = 3$

$n=2$, $y_2 = y(x_2) = y(1.5) = y_1 + h(3x_1^2+1) = 3 + 0.25 + (3\times1.25^2 + 1)$

$y_2 = y(1.5) = 4.421875$

$n=3$, $y_3 = y(x_3) = y(1.75) = y_2 + h(3x_2^2+1) = 4.421875 + 0.25 (3\times1.5^2+1)$

$y_3 = y(1.75) = 6.359375$

$n=4$, $y_4 = y(x_4) = y(2) = y_3 + h(3x_3^2+1) = 6.359375 + 0.25 (3\times1.75^2)$

$y_4 = y(2) = 8.90625.$

Compare $y(2)$ in Ist and 2nd,

$y(2) = 8.90625 - 7.875 = 1.03125$

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