2018.05.20.Sun

노트북:	SW		
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작성자:	정상요		

2018. 5. 18 금 – 50회차

과정 : TI, DSP, Xilinx Znq FPGA, MCU 기반의 프로그래밍 전문가 과정

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y = 3 * e ^ -(x ^ 2)
dy/dx = -2 * x * y, y(0) = 3

```
#include <stdio.h>
#include <math.h>

#define exp 2.71828182845904523536028747135266249775724709369995

int main(void)
{
   //y = 3 * e ^ -(x ^ 2)
   double y[10000] = {};
   double diff_y[10000] = {};
   double new_y[10000] = {};
   double x = -5, n, m, rate;
   float delta_x = 0.001;
   int i, idx;

   //y
   for(i = 0; i < 10000; i++)
   {
      n = pow(x, 2);
      m = pow(exp, -n);
      y[i] = 3 * m;

   //  printf("x = %lf, y[%d]= %lf\n", x, i, y[i]);
      x += delta_x;
   }

#if 1
   //differential_y
   for(idx = 0; idx < 10000; idx++)
   {
      diff_y[idx] = (y[idx + 1] - y[idx]) / delta_x;
   //  printf("diff_y[%d] = %lf\n", idx, diff_y[idx]);
   }
#endif

#if 1
   //values from differential_equation
   for(i = 0; i < 10000; i++)
   {
      x = -5;
      new_y[i] = (diff_y[i] * (-(1 / (2 * (x)))));
```

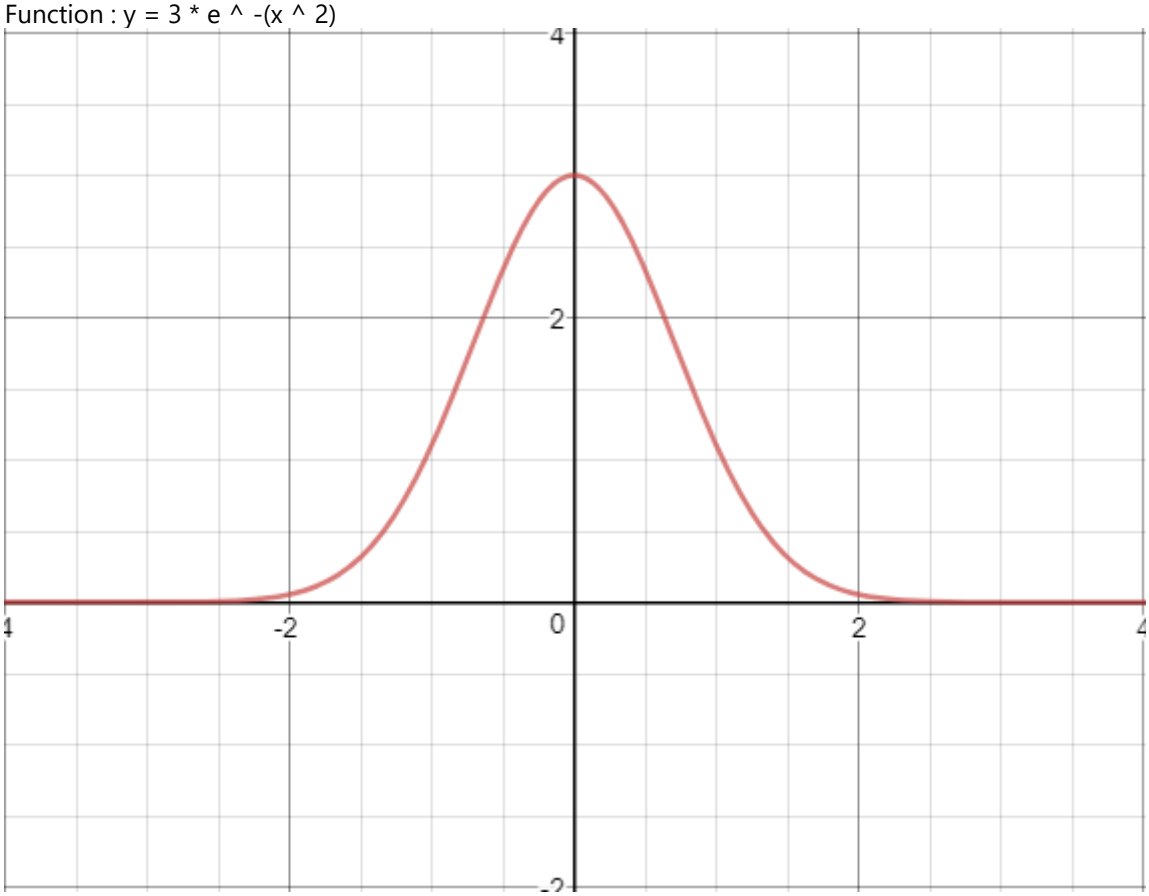
```
        x += delta_x;

        rate = (((y[i] - new_y[i]) / y[i]) * 100);

        printf("new_y[%d] = %lf, Error_rate = %lf\n", i, new_y[i], rate);
    }
#endif


    return 0;
}
```

Function : y = 3 * e ^ -(x ^ 2)



From https://www.desmos.com/calculator