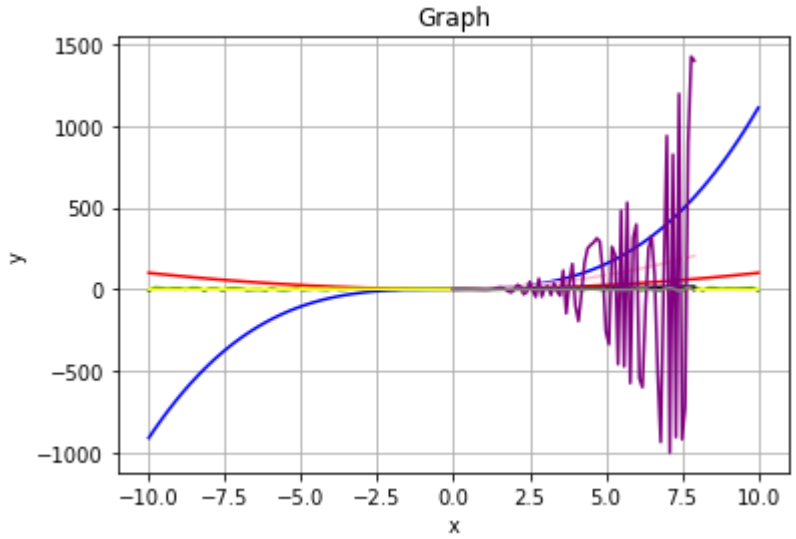
201700949 설재혁

In [70]:

```
import numpy as np
import matplotlib.pyplot as plt
%matplotlib inline

def derivative(f, a, h=0.0000000001):
    return (f(a + h) - f(a))/h

def f1(x):
    return x**2

def f2(x):
    return x**3 + x**2 + x

def f3(x):
    return x*np.sin(x*x*x + 3)

def f4(x):
    return np.cos(np.sqrt(np.e**x + 1) / 2)

x = np.linspace(-10,10,100) # x값 설정
t = np.arange(0, 8, 0.1) # 시간축 설정

# 미분
dy1dx = derivative(f1, t)
dy2dx = derivative(f2, t)
dy3dx = derivative(f3, t)
dy4dx = derivative(f4, t)

# 함수 그래프
plt.plot(x,f1(x), color="red")
plt.plot(x,f2(x), color="blue")
plt.plot(x,f3(x), color="green")
plt.plot(x,f4(x), color="yellow")

# 도함수 그래프
plt.plot(t, dy1dx, color="black")
plt.plot(t, dy2dx, color="pink")
plt.plot(t, dy3dx, color="purple")
plt.plot(t, dy4dx, color="gray")

plt.xlabel("x")
plt.ylabel("y")
plt.title("Graph")
plt.grid(True)
plt.show()
```



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