

# 3. (a)

(방법 1)

$$f(x, y) = \sin(x+y) e^{x+2y}$$

$$\Rightarrow f(0,0) = 0$$

$$D_1 f(x, y) = e^{x+2y} (\cos(x+y) + \sin(x+y)) \Rightarrow D_1 f(0,0) = 1$$

$$D_2 f(x, y) = e^{x+2y} (\cos(x+y) + 2\sin(x+y)) \Rightarrow D_2 f(0,0) = 1$$

$$D_1^2 f(x, y) = 2e^{x+2y} \cos(x+y) \Rightarrow D_1^2 f(0,0) = 2$$

$$D_1 D_2 f(x, y) = e^{x+2y} (3\cos(x+y) + \sin(x+y)) \Rightarrow D_1 D_2 f(0,0) = 3$$

$$D_2^2 f(x, y) = e^{x+2y} (4\cos(x+y) + 3\sin(x+y)) \Rightarrow D_2^2 f(0,0) = 4$$

$$\therefore T_2 f(x, y) = x+y + \frac{1}{2!} (2x^2 + 6xy + 4y^2)$$

$$= x+y + x^2 + 3xy + 2y^2$$

10점

15점

(방법 2)

$$\sin(x+y) = (x+y) - \frac{1}{3!} (x+y)^3 + \dots$$

5점

$$e^{x+2y} = 1 + (x+2y) + \frac{1}{2!} (x+2y)^2 + \dots$$

10점

$$\therefore T_2 f(x, y) = (x+y)(1+x+2y) = x+y + x^2 + 3xy + 2y^2$$

15점

[참고 사항]

FINE 하하 5점