เฉลยแบบฝึกหัด 14.3

1.1. $f_x = 3y - 16x^3y^4$, $f_y = 3x - 16x^4y^3$

1.2. $f_x = \dfrac{2xy\cos^2(x^2y)\sin(x^2y)}{[1-\cos^3(x^2y)]^{\frac{2}{3}}}$, $f_y = \dfrac{x^2\cos^2(x^2y)\sin(x^2y)}{[1-\cos^3(x^2y)]^{\frac{2}{3}}}$

1.3. $f_x = \dfrac{\tan\sqrt{x+y}}{2\sqrt{x+y}}$, $f_y = \dfrac{\tan\sqrt{x+y}}{2\sqrt{x+y}}$

1.4. $f_x = -\dfrac{2y}{(x-y)^2}$, $f_y = \dfrac{2x}{(x-y)^2}$

1.5. $f_x = 2x + y^3\cos xy$, $f_y = 2y\sin xy + xy^2\cos xy$

1.6. $f_x = 8xy^3e^{x^2y^3} - 5x^4y^4\sin(x^5y^4)$, $f_y = 12x^2y^2e^{x^2y^3} - 4x^5y^3\sin(x^5y^4)$

1.7. $f_x = y^2x^{(y^2-1)}$, $f_y = 2yx^{y^2}\ln x$

1.8. $f_x = -\dfrac{e^{-\frac{x}{y}}}{y} - \dfrac{1}{x}$, $f_y = \dfrac{xe^{-\frac{x}{y}}}{y^2} + \dfrac{1}{y}$

1.9. $f_x = -\dfrac{y^2}{x^2+y^4}$, $f_y = \dfrac{2xy}{x^2+y^4}$

1.10. $f_x = 2y^3e^{2x+3z}$, $f_y = 3y^2e^{2x+3z}$, $f_z = 3y^3e^{2x+3z}$

2. $D_1f(1,1) = 3e$, $D_2f(1,1) = 2e$

3. $f_x(2,1) = 8\sqrt{3}$, $f_y(2,1) = 2\sqrt{3}$

4. $\dfrac{\partial f}{\partial x}(1,\dfrac{1}{2},\pi) = 1$, $\dfrac{\partial f}{\partial z}(1,\dfrac{1}{2},\pi) = 0$

5. $f_x(0,0) = 0$, $f_y(0,0) = 1$

6. $\dfrac{\partial f}{\partial x}(0,0) = 0$, $\dfrac{\partial f}{\partial y}(0,0) = 0$

7. 7.1 $D_1f(0,y) = -1$, $D_1f(0,0) = 1$ 7.2 $D_2f(x,0) = -2$, $D_2f(0,0) = 0$