14.5 The Chain Rule

◎ 單選擇題

1. If $z = f(x,y)$, where $x = s+t$ and $y = s-t$, then $\left(\frac{\partial z}{\partial x}\right)^2 + \square\left(\frac{\partial z}{\partial y}\right)^2 = \frac{\partial z}{\partial s}\frac{\partial z}{\partial t}$.

Therefore, $\square =$

(A) -1; (B) s; (C) t; (D) does not exist.

Ans: A [99 學年度]

2. If $z = y + f\left(x^2 - y^2\right)$, where f is differentiable, then $y\frac{\partial z}{\partial x} + x\frac{\partial z}{\partial y} =$

(A) 0, (B) x, (C) y, (D) 1.

Ans: B [100 學年度]

◎ 填空題

1. Let $f(x,y) = g\big(u(x,y), v(x,y)\big)$ where $g(u,v) = v\ln(u)$, $u(x,y) = x + y^2$, $v(x,y) = e^y \tan^{-1}(x)$. Suppose that the estimate for $f(1.2, 0.1)$ by using a **linear approximation** at the point $(x,y) = (\mathbf{1}, \mathbf{0})$ is $a\pi$. Then $a =$ _____

Ans: $\frac{1}{20}$ or 0.05 or $\frac{0.2}{4}$ [105 學年度]