Sec-5.5

2. Ans

$f(z) = |z|^2$ let, $z = x+iy$

$f(z) = x^2+y^2$ But $f(z) = u+iv$

$u = x^2+y^2$; $v=0$

$\frac{\partial u}{\partial x} = 2x$, $\frac{\partial v}{\partial y} = 0$

$\frac{\partial u}{\partial y} = 2y$, $\frac{\partial v}{\partial x} = 0$

i) If $f(z)$ is differentiable then

$\frac{\partial u}{\partial x} = \frac{\partial v}{\partial y}$ or

$2x = 0$ or $x = 0$

& $\frac{\partial u}{\partial y} = -\frac{\partial v}{\partial x}$ or $2y = 0$ or $y = 0$