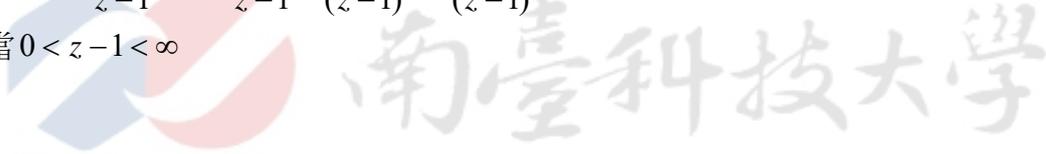


Expand  $f(z) = \frac{1}{z(z-1)}$  in a Laurent series that is valid in a deleted neighborhood of  $z=1$ . State the domain through out which the series is valid. [94 中央機械 9(a)]

$$\begin{aligned} \text{[解]} f(z) &= \frac{1}{z(z-1)} = \frac{1}{z-1} - \frac{1}{z} = \frac{1}{z-1} - \frac{1}{1+(z-1)} \\ &= \frac{1}{z-1} - \left[ 1 - \frac{1}{z-1} + \frac{1}{(z-1)^2} - \frac{1}{(z-1)^3} + \dots \right] \end{aligned}$$

當  $0 < z-1 < \infty$



Southern Taiwan University of Science and Technology