Expand $f(z)=\dfrac{1}{z(z-1)}$ 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)]

[解] $f(z)=\dfrac{1}{z(z-1)}=\dfrac{1}{z-1}-\dfrac{1}{z}=\dfrac{1}{z-1}-\dfrac{1}{1+(z-1)}$

$$=\frac{1}{z-1}-[1-\frac{1}{z-1}+\frac{1}{(z-1)^2}-\frac{1}{(z-1)^3}+\cdots]$$

當 $0<z-1<\infty$

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