

$$16(e). \text{ True. } e^z = 1 + z + \frac{z^2}{2!} + \frac{z^3}{3!} + \dots \quad \forall z \in \mathbb{C}$$

$$\Rightarrow e^z - 1 - z = \frac{z^2}{2!} + \frac{z^3}{3!} + \dots$$

$$\Rightarrow g(z) = \frac{1}{2} + \frac{z}{3!} + \frac{z^2}{9!} + \dots \rightarrow \text{entire function}$$

Defining $g(0) = \gamma_2$ makes the function analytic at $z=0$.

$$g(z) = \begin{cases} \frac{e^z - 1 - z}{z^2} & \text{if } z \neq 0 \\ \gamma_2 & \text{if } z = 0 \end{cases} \quad \text{is an entire function.}$$