

$$\int_{|z|=1} \frac{\sin z}{z^2} dz$$

$|z - z_0| = 1$, Here $z_0 = 0$.

$$\left[\begin{aligned} \therefore f(z_0) &= \frac{1}{2\pi i} \int \frac{f(z)}{z - z_0} dz \\ \int \frac{f(z)}{z - z_0} dz &= 2\pi i f(z_0) \end{aligned} \right]$$

$$\begin{aligned} \int_{|z|=1} \frac{\sin z}{z^2} dz &= 2\pi i f(z_0), \text{ Here } f(z) = \sin z \\ &= 2\pi i f(0) \\ &= 2\pi i \sin(0) \\ &= 2\pi i \times 0 \\ &= 0. \end{aligned}$$