

Evaluate  $\oint_C \frac{e^z}{(z-1)(z+4)} dz$ , where C is the circle  $|z|=3$  described in the positive direction. [91

中央機械 2(a)]

[解]在C內的極點只有單極點  $z = 1$

$$R_1 = \left. \frac{e^z}{[(z-1)(z+4)]'} \right|_{z=1} = \left. \frac{e^z}{2z+3} \right|_{z=1} = \frac{e}{5}$$

$$\oint_C \frac{e^z}{(z-1)(z+4)} dz = 2\pi i \cdot \left(\frac{e}{5}\right) = \frac{2e\pi i}{5}$$

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