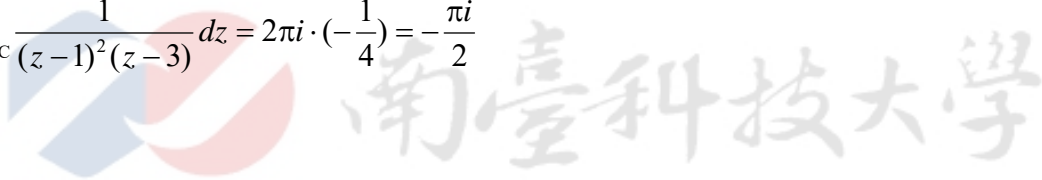


Evaluate $\oint_C \frac{1}{(z-1)^2(z-3)} dz$, where the contour C is the circle $|z|=2$. [106 成大機械 4]

[解]在 C 內的極點只有二階 $z=1$

$$R_1 = \frac{1}{1!} \frac{d}{dz} \left[(z-1)^2 \cdot \frac{1}{(z-1)^2(z-3)} \right] \Big|_{z=1} = \frac{0-1}{(z-3)^2} \Big|_{z=1} = -\frac{1}{4}$$

$$\oint_C \frac{1}{(z-1)^2(z-3)} dz = 2\pi i \cdot \left(-\frac{1}{4}\right) = -\frac{\pi i}{2}$$



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