Use the residue theorem to evaluate $\oint_C \frac{5z^2-3z+2}{(z-1)^3}dz$, where C is an arbitrary simple closed curve enclosing the point $z=1$. [88 清大動機 5(a)]

[解] $R_1 = \frac{1}{2!}\frac{d^2}{dz^2}[(z-1)^3 \cdot \frac{(5z^2-3z+2)}{(z-1)^3}]\Big|_{z=1} = \frac{1}{2}\cdot 10 = 5$

$\therefore \oint_C \frac{5z^2-3z+2}{(z-1)^3}dz = 2\pi i \cdot 5 = 10\pi i$