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Unit 5

Complex Integration

1. Evaluate $\int\limits_{C} \dfrac{1}{2z-3}\, dz$ where C is | z | = 1 by Cauchy's integral formula.

2. Evaluate $\int\limits_{C} \dfrac{e^{-z}}{z+1}\, dz$ where C is | z | = 1.5 by Cauchy's integral formula.

3. Evaluate $\int\limits_{C} \dfrac{1}{(z-1)^2}\, dz$ where C is | z | = 2 by Cauchy's integral formula for derivatives.

4. Calculate the residue at z = *i* for the function $f(z) = \dfrac{1}{z^2+1}$.

5. Expand the function *f* (z) = sin z as Taylor's series about $z = \dfrac{\pi}{4}$.

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