

SNS COLLEGE OF TECHNOLOGY (AN AUTONOMOUS INSTITUTION) COIMBATORE - 35 DEPARTMENT OF MATHEMATICS



COMPLEX INTEGRATION

Cauchy Integral Theorem.

If a function f(z) is analytic and its desirative

f((z) is continuous at all point inside and on

single closed curve c?

$$\int_{C} f(z) dz = 0$$

Cauchy's Integral formula!

If f(z) is analytic within and on closed curve.

'c' and if 'a' is any point within the curve c'then

$$f(a) = \frac{1}{2\pi i} \int \frac{f(z)}{z - a} dz$$
(or)

$$\int \frac{f(z)}{z-a} dz = 2\pi^{n}f(a)$$

Note:

$$\int \frac{f(z)}{(z-a)^2} dz = 2\pi i f'(a)$$

$$\int_{C} \frac{f(z)}{(z-a)^{3}} dz = \frac{2\pi i}{2!} f''(a)$$

$$\int \frac{f(z)}{(z-a)^n} dz = \frac{\partial \pi i}{(y-a)^{n-1}} f^{n}(a) \approx$$