SRM Institute of Science and Technology

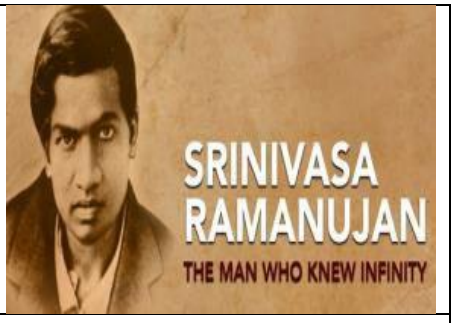
Kattankulathur

DEPARTMENT OF MEATHEMATICS

18MAB102T ADVANCED CALCULUS & COMPLEX ANALYSIS

UNIT -5 Complex Integration

Tutorial Sheet -3



Sl.No.	Questions	Answer
	Part – A	
1	**Find the residues of** $(z) = \frac{e^{2z}}{(1+z)^2}$ **.**	$= 2e^{-2}$
2	**Find the residues of** $f(z) = \frac{e^z}{z^2+a^2}$ **at** z= ai **.**	$= 2aie^{ai}$
3	**Find the residues at their poles of** $(z) = \frac{z}{(z-1)^2}$ **.**	$= 1$
4	**Find the residues of** $(z) = \frac{1}{(z^2+1)^2}$ **.**	$= -\frac{i}{4}, -\frac{i}{4}$
5	**Find the residues at the poles of the function** $(z) = \frac{z}{(z^2+1)}$ **.**	$= \frac{1}{2}, -\frac{1}{2}$
	Part – B	
6	**Evaluate** $\oint_C \frac{e^{2z}}{\cos \pi z} dz$ **where C is a circle** $\|z\| = 1$.	$= -4i \sinh 1$
7	**Using Cauchy's residue theorem evaluate** $\oint_C \frac{7z-1}{z^2-3z-4}$ **where C is an ellipse** $x^2 + 4y^2 = 4$.	$= \frac{16}{3}\pi i$
8	**Evaluate** $\int_0^{2\pi} \frac{d\theta}{5+3\cos\theta}$.	$= \frac{\pi}{2}$
9	**Show that** $\int_0^{2\pi} \frac{d\theta}{1+a\cos\theta} = \frac{2\pi}{\sqrt{1-a^2}}$, **(a < 1).**	
10	**Evaluate** $\int_0^{\pi} \frac{d\theta}{a+b\cos\theta}$, $a > \|b\|$.	$= \frac{\pi}{\sqrt{a^2-b^2}}$

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