
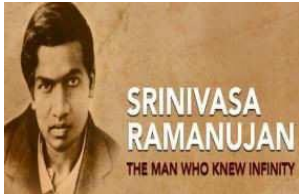


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|  SRM INSTITUTE OF SCIENCE & TECHNOLOGY (Deemed to be University u/s 3 of UGC Act, 1956) | SRM Institute of Science and Technology Kattankulathur | |  SRINIVASA RAMANUJAN THE MAN WHO KNEW INFINITY |
| | DEPARTMENT OF MEATHEMATICS | | |
| | 18MAB102T ADVANCED CALCULUS & COMPLEX ANALYSIS | | |
| | UNIT –V Complex Integration | | |
| Sl.No. | Tutorial Sheet -3 | Answers | |
| Part – A | | | |
| 1 | Find the residues of $f(z) = \frac{e^{2z}}{(z+1)^2}$ | $2e^{-z}$ | |
| 2 | Find the residues of $f(z) = \frac{e^z}{z^2+a^2}$ at $z=ai$ | $2aie^{ai}$ | |
| 3 | Find the residues of $f(z) = \frac{1-e^{2z}}{z^3}$ | -2 | |
| 4 | Find the residues of $f(z) = \frac{1}{(z^2+1)^2}$ | $\frac{-i}{4}, \frac{-i}{4}$ | |
| 5 | Find the residues of $f(z) = \frac{z}{(z-1)^2}$ | 1 | |
| Part – B | | | |
| 6 | Using Cauchy's residues theorem, evaluate $\int_C \frac{e^{-2z}}{(z+1)^3}$ where C is a circle $ z =2$ | $4\pi i$ | |
| 7 | Using Cauchy's residues theorem, evaluate $\int_C \frac{7z-1}{z^2-3z-4}$ where C is an ellipse $x^2+4y^2=4$ | $(16/5)\pi i$ | |
| 8 | Show that $\int_0^{2\pi} \frac{d\theta}{1+a\cos\theta} = \frac{2\pi}{\sqrt{1-a^2}}, (a^2<1)$ | | |
| 9 | Evaluate $\int_0^{2\pi} \frac{d\theta}{5+4\cos\theta}$ | $\frac{2\pi}{3}$ | |
| 10 | Evaluate $\int_0^\pi \frac{d\theta}{a+b\cos\theta}, a> b $ | $\frac{\pi}{\sqrt{a^2-b^2}}$ | |