SRM Institute of Science and Technology, Tiruchirappalli Campus

21MAB102T-Advanced Calculus and Complex Analysis

Assignment-2

Write all the questions.

1. Solve using Laplace transform method $(D^2 - 3D + 2)y = e^{3t}$, given that $y(0) = 1, and\ y'(0) = 0$.
2. Construct the analytic function $f(z) = u + iv$, if $u + v = \frac{\sin 2x}{\cosh 2y + \cos 2x}$.
3. Find the bilinear transformation which maps the points $1, i, -1$ onto the points $i, 0, -i$. Also find the image of $|z| < 1$.
4. Expand $f(z) = \frac{z^2-1}{z^2+5z+6}$ as a Laurent's series in the region $|z| > 3$ and $2 < |z| < 3$.
5. Apply contour integration to evaluate $\int_0^{2\pi} \frac{d\theta}{13+5\sin\theta}$.