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Unit 4

Analytic Functions

1. Show that the function $f(z) = e^z$ is analytic.

2. Show that $u = 2xy + 3y$ is harmonic.

3. Find the harmonic conjugate of $u = e^x \cos y$.

4. Find the image of the circle $|z| = 2$ under the transformation $w = 3z$.

5. Find the fixed or invariant points of the transformation $w = \dfrac{z-1}{z+1}$.

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