

Applied Complex variable-Graduation Examination, 2023

1. Let $f(z) = xy + i\frac{x^2y}{2}$. Find all points $z = x + iy$ where f is analytic.
2. Find all entire functions f such that $|f(z)| \leq \text{Log}|z|$ for $z \neq 0$ and $f(0) = 0$.
3. Evaluate $\int_0^\infty \frac{\cos x}{x^2+1} dx$.