

## Complex Analysis Graduation Examination

1. Find the Laurent expansion of

$$f(z) = \frac{1}{(z-1)(z-2)}$$

for  $1 < |z| < 2$ ,  $|z| < 1$ ,  $|z| > 2$  respectively.

2. Evaluate

$$\int_0^{\infty} \frac{x^2 dx}{x^6 + 1}$$

3. Establish

$$\int_0^{\infty} \frac{dx}{x^3 + 1} = \frac{2\pi}{3\sqrt{3}}$$