Department of Mathematics

15B11MA211

Mathematics-II

Tutorial Sheet 14

B.Tech. Core

Evaluation of Real Integrals Using Residues

1. Evaluate the real integral $\int_0^{2\pi} \frac{1}{3-2\cos\theta} d\theta$ using suitable contour.

2. Evaluate $\int_0^{\pi} \frac{4\cos 2\theta}{4-4\cos \theta+1} d\theta$, using suitable contour.

3. Evaluate the integral $\int_{-\infty}^{\infty} \frac{x^2+1}{1+x^4} dx$, using suitable contour.

4. Evaluate $\int_0^\infty \frac{x^2}{(1+x^4)(x^2+1)} dx$, using suitable contour.

Answers:

- 1. $2\pi/\sqrt{5}$
- 2. $2\pi/3$
- $3.\sqrt{2}\pi$
- 4. $\pi/6$