Exercise 5

Use residues to evaluate the definite integrals in Exercises 1 through 7.

$$\int_0^\pi \frac{\cos 2\theta \, d\theta}{1 - 2a\cos\theta + a^2} \quad (-1 < a < 1).$$

$$Ans. \ \frac{a^2\pi}{1 - a^2}.$$