

Exercise 2

In Exercises 1 through 4, take the indented contour in Fig. 101 (Sec. 82).

Evaluate the improper integral

$$\int_0^{\infty} \frac{x^a}{(x^2 + 1)^2} dx, \quad \text{where } -1 < a < 3 \text{ and } x^a = \exp(a \ln x).$$

$$\text{Ans. } \frac{(1-a)\pi}{4 \cos(a\pi/2)}.$$