

**Exercise 1**

Use residues to evaluate the improper integrals in Exercises 1 through 8.

$$\int_{-\infty}^{\infty} \frac{\cos x \, dx}{(x^2 + a^2)(x^2 + b^2)} \quad (a > b > 0).$$

$$\text{Ans. } \frac{\pi}{a^2 - b^2} \left( \frac{e^{-b}}{b} - \frac{e^{-a}}{a} \right).$$