Math 109 HW7

Fall 2018

1. Evaluate the improper integral

$$\int_1^\infty \frac{1}{x^2+x}dx.$$

2. Evaluate the improper integral

$$\int_{-\infty}^{\sqrt{2}-1} \frac{1}{x^2+2x+3}dx.$$

3. Determine whether the improper integral

$$\int_3^\infty \frac{1}{x^2+4x+4}dx$$

is convergent or divergent. Evaluate it if it is convergent.

4. Determine whether the improper integral

$$\int_0^\infty x\ln|x|dx$$

is convergent or divergent. Evaluate it if it is convergent.

5. Determine whether the improper integral

$$\int_{-\infty}^\infty x^3-3x^2dx$$

is convergent or divergent. Evaluate it if it is convergent.

6. Determine whether the improper integral

$$\int_0^\infty \sin\theta e^{\cos\theta}d\theta$$

is convergent or divergent. Evaluate it if it is convergent.

7. Determine whether the improper integral

$$\int_{-\infty}^{0} \frac{x}{x^4+4} dx$$

is convergent or divergent. Evaluate it if it is convergent.

8. Determine whether the improper integral

$$\int_{0}^{\infty} e^{-\sqrt{x}} dx$$

is convergent or divergent. Evaluate it if it is convergent.