Practice Exam 1 - MATH 1502

Use the blue book provided. Indicate your name and section. The exam will be closed book, closed notes and no calculators will be allowed. Show all your work.

**Problem 1:** Compute the integral
\[
\int \frac{1}{x^2 - x + 2} dx
\]

**Problem 2:** Compute the integral
\[
\int \frac{x^3 + 1}{x^2 + 3} dx
\]

**Problem 3:** Compute
\[
\int_{-\infty}^{+\infty} e^{-|x|} dx
\]

**Problem 4:** Is the following integral convergent? Justify
\[
\int_{2}^{+\infty} \frac{1}{\sqrt{\sin x + x}} dx
\]

**Problem 5:** Is the following integral convergent? Justify
\[
\int_{0}^{+\infty} \frac{\cos x}{1 + x^2} dx
\]

**Problem 6:** Compute the Taylor polynomial of degree 5 of \(\cos x\) about \(x = 0\).

**Problem 7:** Compute the Taylor polynomial of degree 3 of \(\sqrt{1 + x^2}\) about \(x = 0\).