

Worksheet 4

Spring 2016

MATH 222, Week 4: 2.1,2.2,2.3,2.5

Name: _____

You aren't necessarily expected to finish the entire worksheet in discussion. There are a lot of problems to supplement your homework and general problem bank for studying.

Problem 1. Compute $\int \frac{x}{\sqrt{x^2-1}} dx$

Problem 2. Let a be some constant. Compute the following integral in two ways $\int \frac{1}{\sqrt{x^2-a^2}} dx$.

Problem 3. Compute $\int \frac{(z+3)^2}{(40-6z-z^2)^{3/2}} dz$

Problem 4. Compute $\int \frac{e^x}{\sqrt{e^{2x}-1}} dx$. You may find problem 2 helpful.

Problem 5. (a) Compute $\int_0^\infty \frac{x}{\sqrt{1+x^2}} dx$

(b) Compute $\int_{-\infty}^0 \frac{x}{\sqrt{1+x^2}} dx$

(c) What does this say about $\int_{-\infty}^\infty \frac{x}{\sqrt{1+x^2}} dx$

Problem 6. (a) Show that $\int_1^\infty \frac{dx}{x^2-4}$ is not a finite number.

(b) What answer do you get if you forget to account for the asymptote at $x = 2$?