

Math 1220 Exam 2 Study Guide

6.8

- definitions of all the inverse trig function and their corresponding restrictions of domain on the trig functions.
- Understand why $\sin^{-1}(\sin \frac{3\pi}{2}) = -\frac{\pi}{2}$ i.e. not $\frac{3\pi}{2}$
- Derivatives of inverse trig functions

6.9

- Definitions of the hyperbolic functions
- Hyperbolic "Pythagorean" identity $\boxed{\cosh^2 x - \sinh^2 x = 1}$
- Derivatives & Integrals

7.2

- Memorize $\boxed{\int u dv = uv - \int v du}$ & LIPET
- Practice the "Tabular Method" (see my lecture notes)

7.3

- Know the half-angle formulas:
- Know how to solve integrals of type 1-5

$$\boxed{\begin{aligned}\sin^2 x &= \frac{1}{2}(1 - \cos 2x) \\ \cos^2 x &= \frac{1}{2}(1 + \cos 2x)\end{aligned}}$$

↙ (see notes)

- Know how to exploit symmetry in some Type 3 integrals.

7.4

- Know how to use all 3 substitutions:

$$x = a \sin t$$

$$x = a \tan t$$

$$x = a \sec t$$

7.5

- polynomial long division
- partial fraction decomposition

Ex.

$$\frac{2x^2 + x - 1}{(x^2 + 4)^2 (x-1)^2 (x+1)} = \frac{Ax + B}{x^2 + 4} + \frac{Cx + D}{(x^2 + 4)^2} + \frac{E}{x-1} + \frac{F}{(x-1)^2} + \frac{G}{x+1}$$

- Practice: "Evaluating at the Roots" (see notes)

8.1

- when L'Hôpital's Rule applies i.e. $\frac{0}{0}$ & $\frac{\infty}{\infty}$
- when L'Hôpital's Rule fails
- How to apply L'Hôpital's Rule

8.2

- How to handle $\infty - \infty$ and $0 \cdot \infty$
- How to handle 0^0 , ∞^0 , 1^∞