

Math 12002 Exam V Review

Exam V will be given in class on Thursday, December 8, 2016. It will cover section 5.1-5.4, 5.6, and 5.8. This includes the following subjects (with a focus on parts 4 and 5, though these depend on parts 1, 2, and 3).

1 Inverse Functions

- Definition of a one-to-one and inverse function.
- Derivative of f^{-1} in terms of the derivative of f .
- Properties of inverses (cancellation).

2 Exponentials and Logarithms

- Definitions and properties, the number e , and the functions e^x and $\ln x$.
- Compute $\log_a x = y$ (find y given x and vice-versa).
- Solve equations involving logarithms and exponentials.
- Write a^x and $\log_a x$ in terms of natural logarithms and exponentials.
- Simplify expressions using properties of logarithms.

3 Inverse Trigonometric Functions

- Definitions of $\sin^{-1} x$, $\cos^{-1} x$, and $\tan^{-1} x$ including domains and ranges.
- Compute values of these functions, know cancellation properties.

4 Calculus of Exponentials, Logarithms, and Inverse Trigonometric Functions

- Limits involving a^x , e^x , $\log_a x$, and $\ln x$ as well as combinations of such functions.
- Derivatives and integrals of functions involving a^x , e^x , $\log_a x$, $\ln x$, $\frac{1}{x}$, $[f(x)]^{g(x)}$, inverse trig functions, $\frac{1}{\sqrt{1-x^2}}$, $\frac{1}{x^2+1}$, $\frac{1}{x\sqrt{x^2-1}}$, etc.
- Find equations of tangent lines to graphs of these functions.
- Curve sketching for these functions (increasing/decreasing, local max/min, concavity, inflection points).

5 Indeterminate Forms and l'Hopital's Rule

- Know when l'Hopital's Rule can be used and when it can't.
- Use l'Hospital's rule to compute limits.