Review for FINAL EXAM, MAY 05, 8:00–10:00am

Extra office hour: Friday, May 02, 3:00-5:30:00pm
Before Section 21, see previous reviews

On continuity (Chapter 5).
Properties about continuous functions Boundedness, intermediate value theorem.

Exercise 1:
(a). Prove that \( f(x) = x^3 + ax^2 + bx + c \) is a continuous function on \( R \), where \( a, b, c \) are three given constants.
(b). Prove that there is a solution to \( x^3 + ax^2 + bx + c = 0 \).

Derivative (Chapter 6).
Derivative: Definition, algebraic properties, product rule, chain rule.

Exercise 2: If the derivative of function \( y = \ln x \) is given by
\[
\frac{d}{dx} \ln x = \frac{1}{x},
\]
using chain rule to find the derivative of \( y = a^x \).
Mean value theorem The theorem, applications (to the inequalities, etc.

Exercise 3. Prove that for \( x \geq 1 \),
\[
\frac{1}{x} + \ln x \leq 1.
\]

WARNING: YOU ARE RESPONSIBLE FOR CHECKING OUT MY TYPOS!
Comments and question to: mzhu@math.ou.edu
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