

Study guide for quiz 04

Quiz problems include both the lecture contents and homework problems.

1. Memorize the domains and ranges of all six inverse trigonometric functions. Study how to derive the derivatives of inverse trigonometric functions. Pay attention to the $|x|$ factor in the derivatives of \sec^{-1} and \csc^{-1} .
2. Study how to find approximate value of functions using linear approximation (linearization) such as $(1+x)^k$ and $(a+x)^k$, $a > 0$, etc. and how to estimate the error of the linear approximation (memorize the error formula in problem 3 of Homework week 08).
3. Study the equivalence relation on page 7 (and the derivation on page 5-6) of Lecture 12 note (corresponding to page 222-223 of the textbook) and its application in the proof of the Chain rule.
4. Review how to compute $f'(0)$ and $\lim_{x \rightarrow 0} f'(x)$ correctly for the function

$$f(x) = \begin{cases} x^2 \sin(\frac{1}{x}), & x > 0, \\ 0, & x = 0. \end{cases}$$