

18.100A PROBLEM SET 5

due April 19th 9:30 am

You can collaborate with other students when working on problems. However, you should write the solutions using your own words and thought.

Problem 1. *Exercise 13.4.1. Page 193.*

Problem 2. *Exercise 13.5.4. Page 193.*

Problem 3. *Exercise 13.5.5. Page 193.*

Problem 4. *Determine whether the following function $f(x)$ is uniformly continuous on given interval I . Justify your answer.*

(1) $f(x) = x \sin(1/x)$ and $I = (0, 1)$.

(2) $f(x) = \frac{x}{1+x^2}$ and $I = (-\infty, +\infty)$.

Problem 5. *Problem 13-6 page 194.*

Problem 6. *Problem 13-7 page 194.*

Problem 7. *Exercise 17.3.3. Page 239.*

Problem 8. *Exercise 17.4.1.(a),(c) Page 239.*

Problem 9. *Find the 4-th order Taylor polynomial of $x^3 - 2x + 1$ at -1 .*

(The answer must be given in the form of Taylor polynomial.)

Problem 10. *Find a function $f(x)$ which is infinitely many times differentiable but not analytic. Explain why.*