

18.100A PROBLEM SET 2

due March 1st 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. Let $a_n = \frac{1}{\ln n} \left(1 + \frac{1}{2} + \cdots + \frac{1}{n} \right)$ for $n \geq 2$. Show $\lim_{n \rightarrow \infty} a_n = 1$.

Problem 2. Let $a_n \geq 0$ and $\lim_{n \rightarrow \infty} a_n = L$. Prove that $\lim_{n \rightarrow \infty} \sqrt{a_n} = \sqrt{L}$.

Problem 3. Problem 5-2 page 75. (It is enough to give one proof of (b), while the textbook asks to find two proofs.)

Problem 4. Problem 5-7 page 75. (Hint: consider the two cases (1) $a_0 \geq 2$, and (2) $0 < a_0 < 2$.)

Problem 5. Exercise 6.3.1. Page 90.

Problem 6. Exercise 6.4.1. Page 90.

Problem 7. Exercise 6.5.1. (b), (d) Page 90.

Problem 8. Exercise 6.5.4. Page 90.

Problem 9. Problem 6-2 Page 91.

Problem 10. Problem 6-3 Page 91.