

- Total points: 10+10+5 quiz points.
  - Show *complete work*—that is, all the steps needed to completely justify your answer.
  - *Simplify* your answers as much as possible.
  - If you need extra space, work on the back and make a note on the front.
- (1) There is a sequence  $a_1, a_2, \dots, a_n, \dots$  in which  $a_n = \cos(3/n^2)$ . Does this sequence converge, and if so, what is its limit?

(2) Does the series  $\sum_{n=1}^{\infty} \ln \frac{n^3 + 1}{2n^3 + 1}$  converge?

(3) Does the series  $\sum_{n=1}^{\infty} \frac{1}{n}$  converge? (You should recognize this series and know its properties. I don't expect a proof.)