

MATH 133, QUIZ #8

- (1) Do the following infinite series converge or not ? Name the convergence test you are using and show all your work **(7.5 points)**:

(a)
$$\sum_{n=1}^{\infty} \frac{n+3}{2n^2+1}$$

(b)
$$\sum_{n=2}^{\infty} \frac{n \ln n}{4^n}$$

(c)
$$\sum_{n=2}^{\infty} \frac{\ln n}{n}$$

(2) **(2.5 points)**. Consider the series $\sum_{n=1}^{\infty} a_n$ where $a_n = \frac{\cos(n\pi)}{n}$.

(a) Apply the Ratio Test to the series. Evaluate $\lim_{n \rightarrow \infty} \left| \frac{a_{n+1}}{a_n} \right|$. What is the conclusion ?

(b) Does the series converge absolutely, conditionally or does it diverge? Justify your answer.