MA 166: Quiz 8

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You have **15 minutes** to complete this quiz. You may work in groups, but you are not allowed to use any other resources.

Problem 1. For **one** of the problems below, determine whether the series is convergent or divergent. If it is convergent, find its sum. Please justify your answer.

(a) $\displaystyle\sum_{n=1}^{\infty} \frac{n}{n+1}$.

(b) $\displaystyle\sum_{n=1}^{\infty} \frac{5^n}{3^{n+1}}$.

(c) $\displaystyle\sum_{n=1}^{\infty} \frac{7}{4^{n+2}}$.

Problem 2. For **one** of the problems below, determine whether the series is convergent or divergent. State clearly what test you are using and verify that the conditions of the test are satisfied.

(a) $\displaystyle\sum_{n=1}^{\infty} \frac{1}{n \ln n}$.

(b) $\displaystyle\sum_{n=1}^{\infty} \frac{1}{\sqrt{n^2-3}}$.

Solutions

Problem 1 Solutions. 1 (a) The series *diverges*. But why? There are many ways to solve this so I'm just going to choose one I like. Set $a_n \coloneqq n/(n+1)$, i.e., the terms of the series, then observe that

$$\lim_{n\to\infty} a_n = \lim_{n\to\infty} \frac{n}{n+1} = 1$$

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Problem 2 Solutions. 2 (a)

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