

## Homework Set 7

DUE: MAR 21 - 23, 2018 (AT THE BEGINNING OF RECITATION)

1. Decide if the following series converge or diverge. If they converge, find their limit.

(a) 
$$\sum_{n=1}^{\infty} \frac{\pi}{7^n}$$

(b) 
$$\sum_{n=1}^{\infty} \frac{3^n}{10^n}$$

(c) 
$$\sum_{n=1}^{\infty} \frac{1}{\ln(n+2)} - \frac{1}{\ln(n+1)}$$

(d) 
$$\sum_{n=1}^{\infty} \frac{2}{n^2} - \frac{2}{(n+1)^2}$$

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

2. Use the Integral Test to decide if the following series converge or diverge:

(a) 
$$\sum_{n=1}^{\infty} \frac{2}{n^2 + 4}$$

(b) 
$$\sum_{n=2}^{\infty} \frac{1}{n \ln n}$$

(c) 
$$\sum_{n=1}^{\infty} \frac{\ln n}{n^2}$$

3. Use the comparison test to decide if these series converge or diverge:

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

(b) 
$$\sum_{n=1}^{\infty} \frac{n+1}{n^4 - n^2 + 1}$$