

## Homework 03

1. Section 10.6: Problems 11, 25, 26, 28, 29, 30, 35, 39, 41, 49, 53.

Remark: Although not obvious, the sequences  $a_n = \frac{\ln n}{n}$ ,  $b_n = \frac{\tan^{-1} n}{n^2 + 1}$ ,  $c_n = \frac{\ln n}{n - \ln n}$ ,  $d_n = (\sqrt{n+1} - \sqrt{n})$  are all decreasing for  $n > 3$ . You can try to verify this fact, or take it for granted if not successful.

2. Section 10.3: Problem 49.

Hint: use "Bounds for the Remainder in the Integral Test" on page 611.

3. Section 10.7: problems 7, 11, 15, 19, 23, 29, 40, 43, 47,

Hint for problem 40:  $\frac{n}{n+1} = \left(1 + \frac{1}{n}\right)^{-1}$ .

4. Section 10.7: Find a power series that converges on  $(1, 3)$  and diverges otherwise. Do the same for  $(1, 3]$ ,  $[1, 3)$  and  $[1, 3]$ , respectively.