

## PROBLEM SET 16: STRATEGY FOR TESTING SERIES

Note: Most of the problems were taken from the textbook [1].

**Problem 1.** *Test the series for absolutely convergence, conditionally convergence, or divergence.*

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

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

$$c) \sum_{n=1}^{\infty} (-1)^{n-1} \frac{n^4}{4^n};$$

$$d) \sum_{n=1}^{\infty} \frac{1}{n\sqrt{n^2+1}};$$

$$e) \sum_{n=1}^{\infty} \frac{\sin 2n}{1+2^n};$$

$$f) \sum_{n=1}^{\infty} \frac{\sqrt{n^4+1}}{n^3+n};$$

$$g) \sum_{n=1}^{\infty} (-1)^n \tan(1/n);$$

$$h) \sum_{n=1}^{\infty} \frac{n!}{e^{n^2}};$$

$$i) \sum_{n=1}^{\infty} \frac{5^n}{3^n+4^n};$$

$$j) \sum_{n=1}^{\infty} (\sqrt[n]{2} - 1)^n;$$

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

$$l) \sum_{n=1}^{\infty} (\sqrt[n]{2} - 1).$$

## REFERENCES

- [1] J. Stewart: *Single Variable Calculus* 8th Edition, Cengage Learning, Boston 2015.