

# Analysis Lab 7

**Topic: Conditions Related to Convergence**

## **Guidelines for Lab Report**

For this lab, submit a report according to guidelines given below.

1. For the sequences in Section 2, answer Questions 1-5, and enter the information in the tables provided on pages 2-4 of this report.
2. Answer Questions 1-11 from Section 3 on page 4 of this report form.
3. Complete the Questions for Reflection as assigned by your instructor. Write your response to each question on a separate sheet(s), and attach to the rest of this report.

## 2 Using Examples to Enhance Understanding

Sequence:  $(1/n)_{n=1}^{\infty}$

Q1	Q2	Q3	$ a_{50} - a_{25} $	$ a_{100} - a_{80} $	$ a_{225} - a_{175} $	$ a_{500} - a_{400} $	$ a_{850} - a_{825} $	Q4

Sequence:  $\left( \begin{cases} 2 + \frac{1}{n}, & \text{if } n \text{ is even,} \\ -2 - \frac{1}{n}, & \text{if } n \text{ is odd} \end{cases} \right)_{n=1}^{\infty}$

Q1	Q2	Q3	$ a_{50} - a_{25} $	$ a_{100} - a_{80} $	$ a_{225} - a_{175} $	$ a_{500} - a_{400} $	$ a_{850} - a_{825} $	Q4

Sequence:  $\left( \frac{5n - 2}{n + 4} \right)_{n=1}^{\infty}$

Q1	Q2	Q3	$ a_{50} - a_{25} $	$ a_{100} - a_{80} $	$ a_{225} - a_{175} $	$ a_{500} - a_{400} $	$ a_{850} - a_{825} $	Q4

Sequence:  $(\sin(n))_{n=1}^{\infty}$

Q1	Q2	Q3	$ a_{50} - a_{25} $	$ a_{100} - a_{80} $	$ a_{225} - a_{175} $	$ a_{500} - a_{400} $	$ a_{850} - a_{825} $	Q4

Sequence:  $\left( \begin{cases} 3 - e^{-n}, & \text{if } n \text{ is even} \\ 3, & \text{if } n \text{ is odd} \end{cases} \right)_{n=1}^{\infty}$

Q1	Q2	Q3	$ a_{50} - a_{25} $	$ a_{100} - a_{80} $	$ a_{225} - a_{175} $	$ a_{500} - a_{400} $	$ a_{850} - a_{825} $	Q4

Sequence:  $\left(2 + \frac{(-1)^n}{n}\right)_{n=1}^{\infty}$

Q1	Q2	Q3	$ a_{50} - a_{25} $	$ a_{100} - a_{80} $	$ a_{225} - a_{175} $	$ a_{500} - a_{400} $	$ a_{850} - a_{825} $	Q4

Sequence:  $(\cos(n\pi/2))_{n=1}^{\infty}$

Q1	Q2	Q3	$ a_{50} - a_{25} $	$ a_{100} - a_{80} $	$ a_{225} - a_{175} $	$ a_{500} - a_{400} $	$ a_{850} - a_{825} $	Q4

Sequence:  $(n)_{n=1}^{\infty}$

Q1	Q2	Q3	$ a_{50} - a_{25} $	$ a_{100} - a_{80} $	$ a_{225} - a_{175} $	$ a_{500} - a_{400} $	$ a_{850} - a_{825} $	Q4

Sequence:  $\left(\sqrt{4 + \frac{20}{n}}\right)_{n=1}^{\infty}$

Q1	Q2	Q3	$ a_{50} - a_{25} $	$ a_{100} - a_{80} $	$ a_{225} - a_{175} $	$ a_{500} - a_{400} $	$ a_{850} - a_{825} $	Q4

Sequence:  $\left(\begin{cases} 4^n, & \text{if } n \text{ is even,} \\ 4^{-n}, & \text{if } n \text{ is odd} \end{cases}\right)_{n=1}^{\infty}$

Q1	Q2	Q3	$ a_{50} - a_{25} $	$ a_{100} - a_{80} $	$ a_{225} - a_{175} $	$ a_{500} - a_{400} $	$ a_{850} - a_{825} $	Q4

Sequence:  $\left(\frac{(-1)^n}{n^2}\right)_{n=1}^{\infty}$

Q1	Q2	Q3	$ a_{50} - a_{25} $	$ a_{100} - a_{80} $	$ a_{225} - a_{175} $	$ a_{500} - a_{400} $	$ a_{850} - a_{825} $	Q4

Sequence:  $(e^n)_{n=1}^{\infty}$

Q1	Q2	Q3	$ a_{50} - a_{25} $	$ a_{100} - a_{80} $	$ a_{225} - a_{175} $	$ a_{500} - a_{400} $	$ a_{850} - a_{825} $	Q4

### 3 Critical Thinking Questions

In the space provided, write your answers to Questions 1-11. Attach additional sheet(s), if necessary.