

**Read each question carefully and be sure to SHOW ALL WORK. Correct answer without proper justification will not receive a “Complete” grade. Pac fat! Good luck!**

Name: \_\_\_\_\_

**LO 6. Series [CORE].** I can extract information about series and their corresponding sequences of partial sums.

**Criteria for Success:** I can

- convert a series between expanded notation and sigma notation
- determine the sequence of partial sums for a given series
- find exact formulas for sequences of partial sums of arithmetic, geometric, and telescoping series
- determine the sum of a series from the definition as the limit of its partial sum
- use the formulas for both the finite and infinite sum of geometric or telescoping series

**Question:** Consider the series  $\sum_{k=1}^{\infty} \frac{1}{4k^2 - 1}$ .

- (a) Write the first three terms of the sum.
- (b) Find an exact formula for the  $N$ -th partial sum. (**Hint:** Try breaking up the summand using partial fractions.)
- (c) Determine if the sum of the series converges or diverges from the definition as the limit of its partial sum.

**LO 7. Series Tests [CORE].** I can determine convergence or divergence of a series by selecting an appropriate convergence test and applying it.

**Criteria for Success:** I can

- select and apply an appropriate convergence test: nth-term (divergence), geometric series, integral, comparison, limit comparison, p-series, alternating series, ratio, root, or absolute convergence
- distinguish between an absolutely convergent, conditionally convergent, or divergent series.

**Question:** Use the Absolute Convergence and Direct Comparison Tests with the series in the previous question to determine if the series  $\sum_{k=1}^{\infty} \frac{\sin(k)}{4k^2}$  is

- (a) absolutely convergent
- (b) conditionally convergent
- (c) divergent.