

Quiz 6 - In Class

SHOW ALL WORK!!! Unsupported answers might not receive full credit.

Problem 1 [3 pts] True or False

Directions: CIRCLE ALL of the statements that are TRUE. No explanation is necessary. Note that there may be several statements that are true for each question! This question is worth 3 pts, with 1 deducted for each incorrect answer. You cannot score below 0 for this problem.

Suppose that $\{a_n\}_{n \geq 1}$ is a sequence and $\sum_{n=1}^{\infty} a_n$ converges to $L > 0$. Let $s_n = \sum_{k=1}^n a_k$.

A. $\lim_{n \rightarrow \infty} a_n = L$

B. $\lim_{n \rightarrow \infty} a_n = 0$ ✓

C. $\lim_{n \rightarrow \infty} s_n = 0$

D. $\lim_{n \rightarrow \infty} s_n = L$ ✓

E. $\sum_{n=1}^{\infty} s_n$ MUST diverge ✓

F. $\sum_{n=1}^{\infty} (a_n + 1) = L + 1$

G. The divergence test tells us $\sum_{n=1}^{\infty} a_n$ converges to L .

Problem 2 [3 pts]

Determine whether the series:

$$\sum_{k=1}^{\infty} 2^{2-2k}$$

converges or diverges and if it converges, give its value. JUSTIFY your answer!

$$\sum_{k=1}^{\infty} (2)^2 (2)^{-2k}$$

$$4 \sum_{n=0}^{\infty} (2)^{-2(n+1)}$$

$$4 \sum_{n=0}^{\infty} (2)^{-2n} (2)^{-2}$$

$$\frac{1}{4} (4) \sum_{n=0}^{\infty} \left(\frac{1}{4}\right)^n$$

$$\frac{1}{1 - \frac{1}{4}}$$

$$\frac{4}{3}$$

converges, because
 $r < 1$

$$r = \frac{1}{4}$$