

## Quiz No.16

student:

**Problem 1:** Write the formula for the sum of the first  $n$  terms of the geometric progression  $1, r, r^2, r^3 \dots$

**Problem 2:** Give an example of a nonconstant sequence that converges to 1, and is neither decreasing, nor increasing.

**Problem 3:** What is the limit of the sequence with general term  
 $a_n = \frac{2-3n}{2n+1}$

**Problem 4:** Give a formula for the general term of the sequence  $\{0, 2, 0, 2, 0, 2, \dots\}$ , assuming that the pattern of the first few terms continues.

**Problem 5:** Give an example of a sequence which converges to  $\frac{-3}{2}$ , and has  $a_2 = \frac{-4}{7}$ .

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**Problem 6:** Is the series  
 $S = 1 + \frac{1}{2} + \frac{1}{3} + \frac{1}{4} + \frac{1}{5} + \dots$   
convergent or divergent?

**Problem 7:** Is the series  
 $S = 1 + \frac{1}{2} + \frac{1}{4} + \frac{1}{8} + \frac{1}{16} + \dots$   
convergent or divergent? Explain why.

**Problem 8:** Is the series  
 $S = 1 + \frac{1}{3} + \frac{1}{5} + \frac{1}{9} + \frac{1}{17} + \frac{1}{2^n+1} \dots$   
convergent or divergent? Explain why.

**Problem 9:** Give an example of a series which converges and has sum  $\frac{1}{1-\frac{1}{3}}$ .

**Problem 10:** State a necessary condition for the general term of a converging series.