Friday, December 17, 2021 4:13 PM A series is the sum of a sequence eg) 1+3+5+7+... is a series Finite series Infinite 41+42+...+4n+..00 Zun (a) Zun Sum of the first n terms of a series = Sn Sn = 41+ 42+...4n It Sn = finite, I un is consugent
h-200

oo, I hn is distingent

not finite, I un is oscillatory
hotoo, I have a oscillatory Series Problems (1) Examine the nature of the series

1+2+3+4+.. + n+.. ∞ $S_n = 1 + 2 + 3 + ... n$ 1+2+3+...n

A.P. Formula

N(A+1) The series is dillugent. 2) Test-the landungere of the Series $1+\frac{1}{2}+\frac{1}{4}+\frac{1}{8}+\dots$ Series in G.P => Sn = \frac{a}{1-n} $S_h = 1 + \frac{1}{2} + \frac{1}{4} + \frac{1}{8} + \dots$: The series is lon lugent $S_h = 1+\eta + \eta^2 + \cdots$ n=1/2 41 $\frac{1}{h-10} S_{h} = \frac{1-(\frac{1}{2})^{h}}{1-\frac{1}{2}} = \frac{1-0}{1-\frac{1}{2}}$ i. It is en lugent Find the nature of the series 2-2+2-2+2 - .. « Sh= 0 if nisellen 2 if nisellen Sn does not tend to unique limit · The series is oscillatory 4) Find the nature of the following sories a) $1^2+2^2+3^2+4^2+\cdots$ b) $3+\frac{3}{2}+\frac{3}{2^2}+...$ (2) $\sum_{n(n+2)}$ d) $Z log(\frac{h}{h+1})$

THE Sn = H-700 h : The suries is dillergent 4b) $S_n = \frac{3}{2^n}$ $\begin{array}{ll} U & S_h = U \\ h \rightarrow \infty \end{array} \begin{pmatrix} \frac{3}{2^h} \end{pmatrix}$

= 3 : The surius is Conturgent

. The series is Con Mugent 4d) I log m/1

Zun

 $\frac{1}{h-2\infty} \ln = \frac{1}{h-2\infty} \log \frac{n}{n+1}$ $= \frac{1}{h-2\infty} \log \left(\frac{n}{n(1+\frac{1}{h})}\right)$: . The series is Consergent.