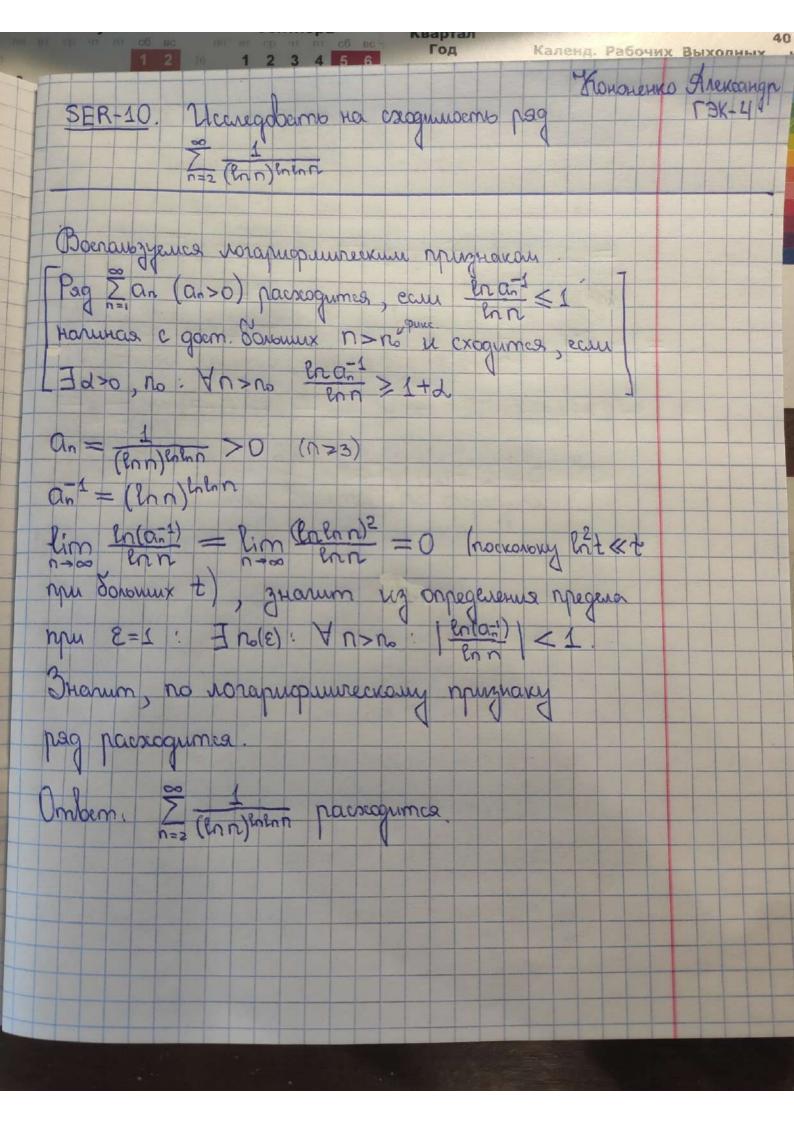
M.K. Taycea 77 ants 000 con 17/(11/1) 2 n+1 Orcioga gun paga Barcoon, up garobno croquia



NAPA NI ∑ n(√2-1) Heotxoguuse yarsbue exoguusamu paga:  $n(\sqrt[4]{2}-1)=n(e^{\frac{1}{2}}en2-1)=n(1+\frac{1}{2}en2+$ + (f)-1) = ln2+ (1) => => riem pega He compensance x my us Ombem: pacsogumas  $\sum_{n=1}^{\infty} \frac{n^{\frac{n+1}{2}}}{(n+\frac{1}{2})^n}$  $\frac{(n+\frac{1}{n})^n}{(n+\frac{1}{n})^n} = \frac{e^{(n+\frac{1}{n})e_{nn}}}{e^{nen(n+\frac{1}{n})}} = e^{(n+\frac{1}{n})e_{nn}} - n(e_{nn}+e_{nn}(1+\frac{1}{n})) = e^{(n+\frac{1}{n})e_{nn}}$ = enen+ 1 enn - nenn + - nen (1+ 1/2) = = e flun - n(1/2+ = (1/2)) = e f (lun - + + = (1/2)) = e (1/2) => rience piega ne compenience k my mo Omben: pacsogumas  $\sum_{n=1}^{\infty} \left( \frac{2n^2 + 1}{2n^2 + 3} \right) n^2$ 

 $\left(\frac{2n^2+1}{2n^2+3}\right)^{n^2} = \left(1-\frac{2}{2n^2+3}\right)^{-\frac{(2n^2+3)}{2}\cdot\frac{2n^2}{(2n^2+3)}} \xrightarrow{n \to \infty} e^{-1} = 0$ Typus => ruenos paga ne compenianos x mesos ∑ an Ombem: pacsogumce > (1+4)n2 en  $(1+\frac{4}{n})^{n^2} \stackrel{n\to\infty}{\sim} \frac{e^n}{e^n} = 1 \Rightarrow$ Thu => men paga ne compensance x my no S a Omben: pacsogumas Pagukaumuni npuznak Koum:  $\sum_{n=0}^{\infty} a_n$ ,  $a_n \ge 0$ coogunce, eau parunae c recomptoro nauera bunameno nan ≤ que, zge q<1  $\sum_{n=1}^{\infty} n!$ racsogumce, eau harunae c nexomonoro nauena birnameno Jan > 1 anti Thuzuar D'Arandera: < 31 ∑an, an≥0 => ( escagumas, ecu narunas e necomoporo navera bunameno lanti/ant sq , 2ge q < 1 Oml nauera binameno |anti/an > 1

Thursday Adeis ∑апви сходитая, если выпажено 1. Еап3 монотонна с некоторого нашера и ограничена 2. \sum Bn coogumes Thursday Dupurale: ∑ anon cooquince, eau brinsipiero 1. nocuegobanewhocmb racmuruus cyuu 181+..+Bn | € C orpanurena 2. {an} uonomorino emperiuma k rigino chekomoporo hauena  $\sum_{n=1}^{\infty} \frac{n!(2n+1)!}{(3n)!}$ Marupas c n=3  $\frac{a_{n+1}}{a_n} = \frac{(n+1)!(2n+3)!(3n)!}{(3n+3)!} = \frac{(n+1)(2n+2)(2n+3)!}{(3n+4)(3n+2)(3n+3)} < \frac{(3n+4)(3n+2)(3n+3)!}{(3n+4)(3n+2)(3n+3)}$  $<\frac{2n\cdot 3n\cdot 3n}{3n\cdot 3n\cdot 3n} = \frac{2}{3} < 1 = >$ => uneence exogunocmo no np. D'Arantera Imben: exagunce n=1 n! 3n

 $\frac{\alpha_{n+1}}{\alpha_n} = \frac{(n+1)^{n+1}}{(n+1)!} \frac{n! \cdot 3^n}{3^{n+1} \cdot n^n} = \frac{1}{3} \cdot \frac{(n+1)^n}{n^n} = \frac{1}{3} \cdot (1+\frac{1}{n})^n + \frac{1}{3} \cdot \frac{(n+1)^n}{n^n} = \frac{1}{3} \cdot \frac{(n+1$ 2 2 2 manyane hercamorlo 4 3 21 => uneemce exogunacmo no mp D'Thrandepa Omben: escogumce ∑ (5-(-1)n)n - nyamb 3mo pag ∑ an be rueno an >0 Thyong pag & Bo marol, uno nou rémusix n ruenus Brand, a nou recensus n ruenus Brand  $\sum_{k=1}^{\infty} \beta_{n} = \sum_{k=1}^{\infty} \left(\frac{3}{2}\right)^{2k+1} \cdot \frac{1}{(2k+1)^{2}}$  $\left(\frac{3}{2}\right)^{2k+1}$   $\left(\frac{1}{2k+1}\right)^{2}$   $\left(\frac{3}{2k+1}\right)^{2}$   $\left(\frac{3}{2k+1}\right)^{2}$   $\left(\frac{3}{2k+1}\right)^{2}$ => ruenos pega ne compenience « myero, peg Ebn pacsagumae no nocompositio an > Bn =>
no nouzhary chabnestie pag Ian more pace Ombem: pacsogumes  $\sum_{n=0}^{\infty} ((1+\frac{1}{n})^{n+1} - e)^{\frac{3}{2}}$ (1+1)"+1-e=e(n+1)en(1+1)-e=  $=e(e^{(n+1)(\frac{1}{n}-\frac{1}{2n^2}+\delta(\frac{1}{n^2}))-1}-1)=$ 

= == + = ((1+A)n+1-e)=~(至)= 1 (至)= 1 21 Pag = 1 congume nou p > 1
pacogume nou p ≤ 1 indepa Thuznak chabrerus (Inbubaverniochu) ∑un u ∑ vn marstvi, ~mo un ≠0; vn≥0 eau I lim Un = K (0 < K < 00), mo page coogence mão pacsogence ognobremento semmes of more regar soluborement bly B=0 weres possa reg \( \frac{1}{173/2} \) csogumce => u ucsogumin reg csog =1 no rpuzuaky chabnemus Ombern: coagumca 2 (enn)enenn 1/ Kakae-mo noeverto, npurpak neorebughtin Sorapuquireckut nouzuak ∑ an, an>0 pacsogumas, eau enail ≤1 coogumas, eau enail > 1+d and = (ln n) en en n

lim enn = lim (ln lnn) = 0

noo enn noo enn
zuarum a nexomonoro manerima enn < 1 nocle Bn = no vorapupu. npuznany uneen pacsogui no m Omben: passagumas Ombo > nenin rge Unnerpauswie npuznak Kanne an. f(x)≥0, nelozpacmaiouzare, morga Bn Ef(n) u Sf(x)dx ognobremenno cxog um pac = 15  $f(x) := \frac{1}{x \ln^2 x}$ = 2  $\int_{2}^{\infty} \frac{dx}{x} = \int_{2}^{\infty} \frac{d\ln x}{x} = \frac{1}{\ln x} \Big|_{2}^{\infty} = +\ln 2 - \cos g.$ = = zna znarum no ummerpaubnany npuznary no 1 Ombem: exagumae Om  $\sum_{n=1}^{\infty} \frac{(-1)^n \ln^{2020} n}{n} = \sum_{n=1}^{\infty} a_n B_n$   $\log a_n = \ln^{2020} n, B_n = (-1)^n$  $\sum_{n=2}^{\infty} ($ rge an usnomonno y Subaem k mjuno c an

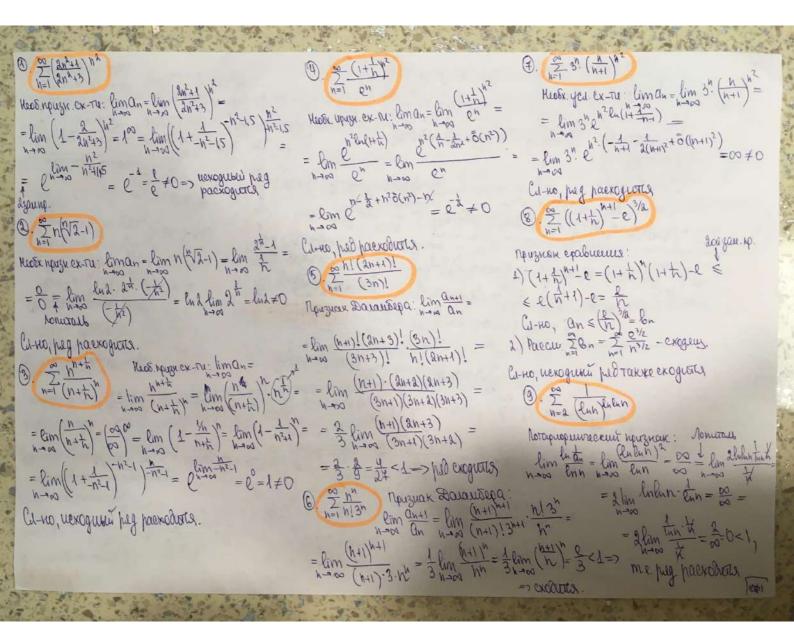
noclegabamenomocno racmurenose cyun Bn = B1+..+Bn & 1, no naroskumerina => => 1Bn1 < 1 - ognammerur no muznaky Dupuscie czogunacino Ombem: exogumas oc cos 2n = oc anbn rge an = enenn, Bn = cos 2n an usnomonno ysolbarom k mjus |Bn | = | Bn+ ... + Bn | = 13mn rossyn + sinn cosyn - Asinn = 1sin 11 · | sin 1 · cos 2 + sin 1 · cos 4 + 81 + sin 1 · cos 2n = = 21sin1 | sin = - sin = + sin = - sin = + . + sin 2n+1 - sin 2n+1  $=\frac{1}{2\sin 1} | \sin \frac{2n+1}{2} - \sin \frac{1}{2} | \leq \frac{2}{2\sin 1} = \frac{1}{\sin 1}$ znarim noce racmurnine cymu By ornaniviena no muznaky Dunuscie coogumocomb Ombern: coaquemas  $\sum_{n=2}^{\infty} (-1)^n \frac{n!n!}{enn} = \sum_{n=2}^{\infty} a_n b_n$ rge an = "\", Bn = (-1)" |an| = en < e - ornanwierur, ruenur nonomonno youb. chek. n

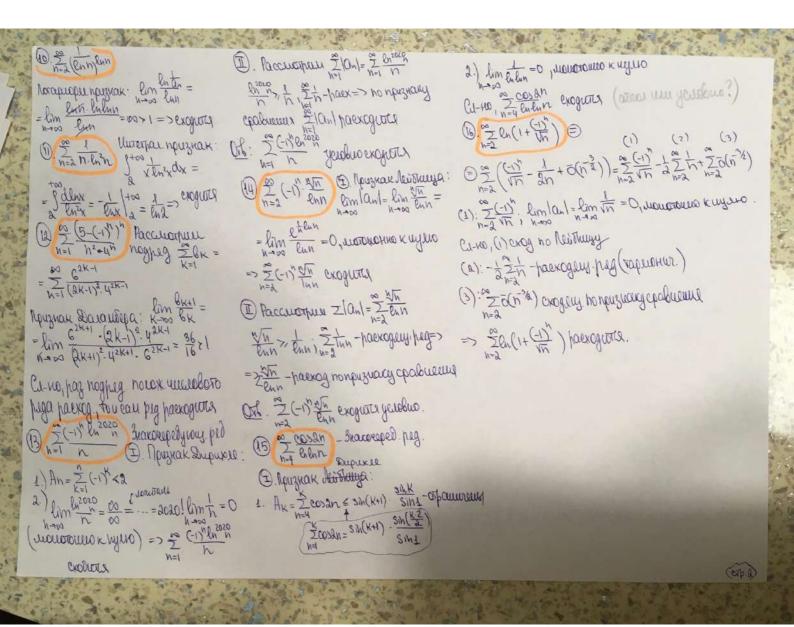
pacauompun pleg & Bn = \$ cndn rge cn = = 1, dn = (-1) Ch nonomonno y Tubaron K my 110 don | Dn | = | dn + .. + dn | & 1 - ornamurerus znarum no np. Durusque & Br cxog znarum no m. Adene ucxognisti peg cxog Omben: cocagumas [ (-1) 2+(-1) = [ (= (-1) + =) raccuompum rueg \( \frac{2}{n} (-1)^n\) on essegumes no nous navy Ale Dupuscie raccusmymme preg \$ 1 n on pacsongumas u pacasgenserace puga nangraemae pacasgens Ombem: passogumce N15

SER-6. Ucasegobagnic na osogenio em pag  $\sum_{h=1}^{\infty} \frac{h^h}{h! \, 3^h}$ Temenne Temennemen mpugnaen cx-mu pagol Eau que rue paga  $\int_{-\infty}^{\infty} a_n$  cyujeombyem maroe rue o q, 0 < q < 1, 0 < q < $\left|\frac{a_{n+1}}{a_n}\right| \le q$ , mo pag adc. exceg., eaux | an+1 | 7/1 => passog.  $\lim_{n\to\infty} \frac{a_{n+1}}{a_n} = \lim_{n\to\infty} \frac{(n+1)^{n+1}}{(n+1)!} \frac{n!}{3!} \frac{n!}{3!} = \lim_{n\to\infty} \frac{(n+1)^n}{n!} \frac{1}{3!} = \lim_{n\to\infty} \frac{a_{n+1}}{n!} = \lim_{n\to\infty} \frac{a_{n+1}}{n$ =  $\lim_{n\to\infty} \left(1 + \frac{1}{n}\right)^n \frac{1}{3} = \frac{e}{3} < 1.$  =) =) pag exogumes.

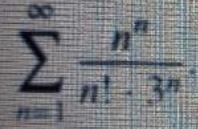
SER -9.

$$(1+\frac{1}{h})^{h+1} - e)^{\frac{3}{2}}$$
 $eccent \ \forall h \ge 1 \ (1+\frac{1}{h})^{h+1} - e)^{\frac{3}{2}} \le \frac{2}{h} \approx \frac{3}{h} \approx \frac{3}{$ 





## SER-7. Hericanian in the exchange is par



SER-20. Исследовать на сходимость ряд

$$\sum_{n=1}^{\infty} \frac{(-1)^n \cos \frac{\pi}{n}}{n}.$$