

7/n= 1.3.5. -- (2M1) Xnt = 2nt / Xn = Xn , Dc Xn = MCT > {Xn} crqs. X= 1im Xn Method 1. 7h: 17 2k1 = 17 (1- 1/4) $\frac{\sum -\frac{1}{2k} = -\frac{1}{2} \sum_{k=1}^{N} \frac{1}{k} = -\infty, \text{ as } n \to \infty}{\lim_{k \to \infty} e^{k} = 0}$ $\lim_{k \to \infty} e^{k} = 0 \Rightarrow \lim_{k \to \infty} e^{k} = 0$ Squelze > lim xn=0. Method 2. Telescope enerything (n+1 5 (n+2)

٠,

(b) $x_{11} = \frac{1}{2} \sum_{k=1}^{2} \frac{(n+1)^{k} - n+1}{2} = \frac{2n+1}{2} = \frac{2n+1}{2$	The Chinese University of Hong Kong, Shenzhen
$x_{n} > \sum_{k=n}^{n+1} \frac{1}{(m_{1})^{2}} = \sum_{k=n}^{n+1} \frac{1}{(m_{1})^{2}$	(b) $\chi_{n} \leq \frac{(n+1)}{\sum_{n} - n} = \frac{1}{\sum_{n} (n+1) - n+1} = \frac{m+1}{n} \Rightarrow \nu$
⇒ (im Xn = 2. Noo 2. proof. Dif x: kh (k(2). then Sin (nx) = 0. So so sin (nx) = 0, cras. Def xtkh. if sin (nx) cogs, then (im Sin(nx) = 0) Sin' (nx) + (ws'(nx) = 1, yn. ⇒ 1im (vs' (nx) = 1) Noo Sin' (nx) + (ws'(nx) = 1, yn. ⇒ 1im (vs' (nx) = 1) Noo Sin' (nx) + (ws'(nx) cosx + Coshx) sinx >0 ⇒ lim (ws'(nx) sinx > 0 ⇒ lim (ws'(nx)) = 0 Contradiction noo to 3. Anit. San dras (x) ⇔ yto	Kom
2. proof. Off x:kh (k(2). then Sin (nx)=0. So Sin (nx) =0. cogs. Of xtkh. if Sin(nx) cogs, then lim Sin(nx)=0. Sin' (nx) + (bsinx) =1. yn. =) lim (bsinx)=0. Sin' (nx) + (bsinx) cosx + (bshx) sinx =0. Sin((nt))x) = Sin(nx) cosx + (bshx) c	$ x_n = \frac{ x_n }{ x_n } = $
Sin' (nx) + (bs'(nx) = 1. yn. =) im (bs'(nx) = 1. Sin' (nx) + (bs'(nx) = 1. yn. =) im (bs'(nx) = 1. No = 1. Sin' (nx) + (bs'(nx) = 1. yn. =) im (bs'(nx) = 1. No = 2. Sin' (nx) + (bs'(nx) = 1. yn. =) im (bs'(nx) = 1. No = 2. Sin' (nx) + (bs'(nx) = 1. yn. =) im (bs'(nx) = 1. No = 2. Sin' (nx) + (bs'(nx) = 1. yn. =) im (bs'(nx) = 1. No = 2. Sin' (nx) + (bs'(nx) = 1. yn. =) im (bs'(nx) = 1. No = 2. Sin' (nx) + (bs'(nx) = 1. yn. =) im (bs'(nx) = 1. No = 2. Sin' (nx) + (bs'(nx) = 1. yn. =) im (bs'(nx) = 1. No = 2. Sin' (nx) + (bs'(nx) = 1. yn. =) im (bs'(nx) = 1. No = 2. Sin' (nx) + (bs'(nx) = 1. yn. =) im (bs'(nx) = 1. No = 2. Sin' (nx) + (bs'(nx) = 1. yn. =) im (bs'(nx) = 1. No = 2. Sin' (nx) + (bs'(nx) = 1. yn. =) im (bs'(nx) = 1. No = 2. Sin' (nx) + (bs'(nx) = 1. yn. =) im (bs'(nx) = 1. No = 2. Sin' (nx) + (bs'(nx) = 1. yn. =) im (bs'(nx) = 1. No = 2. Sin' (nx) + (bs'(nx) = 1. yn. =) im (bs'(nx) = 1. No = 2. Sin' (nx) + (bs'(nx) = 1. yn. =) im (bs'(nx) = 1. No = 2. Sin' (nx) + (bs'(nx) = 1. yn. =) im (bs'(nx) = 1. No = 2. Sin' (nx) + (bs'(nx) = 1. yn. =) im (bs'(nx) = 1. No = 2. Sin' (nx) + (bs'(nx) = 1. yn. =) im (bs'(nx) = 1. No = 2. Sin' (nx) + (bs'(nx) = 1. yn. =) im (bs'(nx) = 1. No = 2. Sin' (nx) + (bs'(nx) = 1. yn. =) im (bs'(nx) = 1. No = 2. Sin' (nx) + (bs'(nx) = 1. yn. =) im (bs'(nx) = 1. No = 2. Sin' (nx) + (bs'(nx) = 1. yn. =) im (bs'(nx) = 1. No = 2. Sin' (nx) + (bs'(nx) = 1. yn. =) im (bs'(nx) = 1. No = 2. Sin' (nx) + (bs'(nx) = 1. yn. =) im (bs'(nx) = 1. No = 2. Sin' (nx) + (bs'(nx) = 1. yn. =) im (bs'(nx) = 1. No = 2. Sin' (nx) + (bs'(nx) = 1. yn. =) im (bs'(nx) = 1. Sin' (nx) + (bs'(nx) = 1. yn. =) im (bs'(nx) = 1. Sin' (nx) + (bs'(nx) = 1. yn. =) im (bs'(nx) = 1. Sin' (nx) + (bs'(nx) = 1. yn. =) im (bs'(nx) = 1. Sin' (nx) + (bs'(nx) = 1. yn. =) im (bs'(nx) = 1. Sin' (nx) + (bs'(nx) = 1. yn. =) im (bs'(nx) = 1. Sin' (nx) + (bs'(nx) = 1. yn. =) im (bs'(nx) = 1. Sin' (nx) + (bs'(nx) = 1. yn. =) im (bs'(nx	$\Rightarrow \lim_{n\to\infty} \chi_n = 2.$
Sin' (nx) + (w s'(nx) = 1. y n. \Rightarrow 1 im (w s'(nx) = 1. n - ∞ Sin((n t) x) = Sin(n x) cosx + coshx) sinx $\Rightarrow 0 \Rightarrow 0$. \Rightarrow 1 im $cos(nx)$ sinx $\Rightarrow 0 \Rightarrow$ 1 in $cos(nx)$ = 0 contradiction n - ∞ $\Rightarrow 0$ $\Rightarrow $	2. proof. $OF(x:kh (k(k)), then Sin (nx) = 0.$ So $\sum_{n=1}^{\infty} Sin (nx) = 0, cogs.$
Sin((nH)x) = Sin(nx) cosx + Coshx) sinx $\Rightarrow 0 \Rightarrow 0$ $\Rightarrow 0 \Rightarrow 0$ $\Rightarrow \lim_{N \to \infty} \omega_{s}(nx) \sin x \Rightarrow 0 \Rightarrow \lim_{N \to \infty} \omega_{s}(nx) = 0 \text{Contradiction}$ $\Rightarrow 0 \Rightarrow 0$	Orf xtka. if ESin(nx) ags, then lim Sin(nx) =0
3. Ani b. Ean dugs (*) (*) . US>0. UP+N, (INEN.) ST UN =N. (and) to take the control of the co	· ,
3. An= h. San dras (*) (*) . HS>0. UP+N, (INEN). StynzN. [Ant] t t antples. (Ant) t t antples. [Ant] t t antples.	Sin((n+1)x) = Sin(nx) cosx + Coshx) sinx
3. An=1. San dvgs (*) (*) (*) NSO. UPTN, (INEW.) St UN >N. [Ant] t + antp[< s. Canchy Criterion **Y(70., INEW. St VM >n> N. [Ant] t + antp[< s.	\rightarrow 0 \rightarrow 0.
(*) (\$). US>0. UP+N, (\$\frac{1}{2}NEW.) St \n>N. [Ant] t \to t \ant p < \s. (anchy Criterion \$\times \times \	=> lim (w(nx) Sinx >0 => lim (ws(nx) =0 Contradiction n>00
(ant) to tamples. Canchy Criterion Styn, Stymons N [ant) to tamples.	3. Anits. Ean dugs depends on & & P.
Canchy Criterion >> YG70., INEM, Stym>n>N [Ant] + + Am] < S.	(*) (). WS>O. WPLN, (INEW.) SI YNZN.
Canchy Criterion >> YG70., INEM, Stym>n>N [Ant] + + Am] < S.	[ant] to + antples.
Lant, to tam >>> NEW.	
(ant) to tam = s. (ant) to tam = s. (b) ASTO. FINEN St. AND N PEN. (clepends only on s.) (ant) to tam = s.	V
m=ntp, pen clepends only on s. antl + 1 - + antp < 5.	[ant t + am < 2.
ant tint aut (5.	WESTONEN ST. HISN UPEN.
	antition antition and antition

proof. I an cras > lim anto. > 3 NEW. S. Z & N > N. (an 0) < | > DEan < => Yn >N 0 = an < an => \(\frac{\S}{2} \) an cras $|\widetilde{lm}(1)| = \frac{1}{\sqrt{n}} \text{ does not exist } \Rightarrow dvgs.$ $|\widetilde{ln}(1)| = \frac{1}{\sqrt{n}} = \frac{1}{\sqrt{n}} = \frac{1}{\sqrt{n}}$ $|\widetilde{ln}(1)| = \frac{1}{\sqrt{n}} = \frac$ t. (a) Entropo dogs > I (H) Intropo dogs crgs: W.T.S. { Intropo } VO. $\frac{\sqrt{n}}{n+200} = \frac{1}{\sqrt{n}+\frac{200}{\sqrt{n}}}$ $\frac{1}{\sqrt{n}+\frac{200}{\sqrt{n}}}$ => Z (1) The cogs . By alternating series test 6. proof (a) Ratio test: of IX/c1. $\frac{\lim_{N\to\infty} \frac{\chi^{n+1}}{|x|}}{|x|} = \lim_{N\to\infty} \frac{|x|}{|x|} = |x| < 1 \implies \text{e.g.s.}$ (6) Ratio test: tim | x / (n+1); |= tim x = 001 => crass