LISTA DE EXERCÍCIOS 2 - PAA

1) Détermine e prove una equivalencia reintotres par es reconências abava:

a) T(n) = T(n-3) + 1

0-3K = -3K+0

T(n-6-3)+1+21=T(n-9)+3

T(n-9-3)+3+3=T(n-12)+4

= IT(n-3K)+K

b) T(n)= 2T(n-2) + log n *Interes Ante esse (50, quando multiplica por 2

2. [2] (n-4)+log(n-2)/1/0g(n) = 3/1/(n-4)+2/0g(n-2)+log(n)

2 [4T (n-6) + log (n-4) + 2 log (n-2) + log n=

87 (n-6)+ 4 log (n-4)+2 log (n-2)+log n

27(n-2K)+ & 2.109(n-2i) Achando o non n-2K=0 - 2K=-n/d

OT(n) = T(n-1) + n

T(n-1-1)+(n-1)+n=T(n-2)+(n-1)+n=T(n-2)+2n-1

T(n-3)+(n-2)+(n-1)+n = T(n-3)+3n-2-1

d) 2T(n-1)+2+1 2[2[(n-2)+(n-1)2+1]+n+1=+47(n-2)+2(n-1)2+2+n2+1 2[4T(n-3)+2(n-2)2+2+(n-1)2+1]+12+12+8T(n-3)+4(n-2)2+4+2(n-1) 27(n-K)+ & 2'(n-i)2) - 2" croce + représ que 5 le 1171/10 Determine e prove ume aquivalência assintotros para as recorrências abaves: a) $T(n) = 2T\left(\frac{n}{2}\right) + 1$ 47 (4) +2 +3 - K= A 501 + (C-1) The (n) Th 2 T()+ 2 2 - 2 2 T(1) + 22 2 (T(1) 2 2 1097 $n \cdot T(1) \cdot n \cdot T(1) = O(n)$ b) $T(n) = 4T(\frac{n}{2}) + \log(n)$ = $4(4T(\frac{n}{4}) + \log(\frac{n}{2})) + \log(n) = 16T(\frac{n}{4}) + 4 \cdot (\log(n) - \log(2)) + \log(n)$ = 16T (=)+ 5. log(n) - 4 log(2) = 4. (16T (2) + 109 (4)) + 5109 (n) -4 log (2) = 64T(8)+16 log(4)+5log(n)-4 log(2) 1+(6-10)T = 64T(3)+16. (log(n)-log(4))+5log(n)-4log(2) = 64T (7) + 16 log(n) - 16 log(4) + 5 log(n) - 4 log(2) = 64T (3) + 21 log (n) - 32 - 4 log (2) $f(n) = 4^{\kappa} + (\frac{\pi}{2^{\kappa}}) + \frac{\kappa^{-1}}{2^{\kappa}} + \frac{\pi}{4^{\prime}} (\log (9/2^{\prime}))$ $\kappa = \frac{\pi}{2^{\kappa}} = 2^{\kappa} = 2^{\kappa} = n$ $f(n) = \frac{1}{3} \frac{\log_2 n}{\Gamma(3)} + \frac{24^i}{24^i} \left(\log(n) - i \log(2i) (2-4) = i - \frac{\log_2 n}{24^i} \right)$ $n^2 + \log(n) = \frac{24^i}{100} - \log(2i) = \frac{\log_2 n}{100}$

7/60+/17	7 2 + 12 + 19	7477/2	+7.7(3)+3+10
11731 [23]	10 9 7 3) 110 3	7. 1. 1. 1. 2.7.	
X / D /	1. / R /	A A	& Propriedade de log
I(K)=7. T(3K)	1 2 7 (3)	Achepdo o K	X / / /
100 (0) 1003	1.6	U = 7 U	3 = 1093
W= 1-3, 1(7)+ 5	13.	- 109 P	109.7
	109.0.1	7 3 =	7 3
= W 1003 (3) +	n. 8 32/	P.6. 7 2 1	<u> </u>
	log_(n)	lan 7	(-1
= 1033 (11	R. (7/3) -1	= 1103337	= 3 . (10 7)
	(9/3)-3	3	
Como no domin	2		
1 / lm 7-1			
(-) (N 1003)			
(-) (N 1003)			
(3) 117/12 and a Teogemi	Mestre determine	me equivalencia 3	ssintótics para
3) Utilizando o Teogemi	Mestre determine	me equivalencia z	ssintótics para
	Mestre determine	ms equiplencis 3	syntótics para
3) Villizando o Teorem? 2) T(n) = 2T (1/4) + 1	log a = log 2	me equivalencia a	T(W) < W (CU20 T)
3) T(n) = 2T (1/4) + 1	log a = log 2	me equivalencia ?	$f(u) = U_{100}^{2} (C420 7)$ $f(u) = U_{100}^{2} (C420 7)$
3) T(n) = 2T (1/4) + 1	Nestre determine a	equivalences 3 = [1/2] = (1/2) cross	109.0
3) T(n) = 2T (1/4) + 1	Nestre determine a log a = log 2 1 < n	$= \sqrt{2}$	$f(u) = U_{100}^{100} (CH20 T)$
2) T(n)=2T(1/4)+1 a=2 b=4 y(n)=1	109 a = 109 2 1 < r	$= \sqrt{2}$	$f(u) = U_{100}^{100} (CH20 T)$
i) T(n) = 2T (1/4) + 1 a=2 b=4 y(n) = 1	109 a = 109 2 1 < r	$= \sqrt{2}$	$f(u) = U_{100}^{100} (CH20 T)$
37(n) = 27(4) + 1 $a = 2$ $b = 4$ $4(n) = 1$ $27(24)$ $a = 27(24)$ $a = 27(24)$	109 a = 109 2 1 < n 1 < n	$= \sqrt{12}$ $O(n^{2})$ $O(n^{3})$	$f(u) = U_{100}^{100} (CA50 7)$
i) $T(n) = 2T(^{1}/4) + 1$ $a = 2$ $b = 4$ $a = 2$ $b = 4$ $b = 4$ $b = 4$	$\frac{\log a = \log 2}{1 < n^2}$ $\frac{1}{2} < n^2$	$= \sqrt{12}$ $O(n^{2})$ $O(n^{3})$	$f(n) \le N$ $f(n) = N^{\log_{2} 0} (cAso 1)$ $f(n) > N^{\log_{2} 0} (cAso 2)$ $f(n) > N^{\log_{2} 0} (cAso 3)$
37(n) = 27(4) + 1 $a = 2$ $b = 4$ $4(n) = 1$ $27(24)$ $a = 27(24)$ $a = 27(24)$	$\frac{\log a = \log 2}{1 < n^2}$ $\frac{1}{2} < n^2$	$= \sqrt{12}$ $O(n^{2})$ $O(n^{3})$	$f(n) \le N$ $f(n) = N^{\log_{2} 0} (cAso 1)$ $f(n) > N^{\log_{2} 0} (cAso 2)$ $f(n) > N^{\log_{2} 0} (cAso 3)$

WIT(n)=4T(1/2)+1 b=2 hog a = log 4 = 2 W) T(n) = 4T (n/2)+n $n < n^2 \Theta(n^2)$ casol 110)-12 169 a = 109 4 = 2 Wil T(n)= 4T (1/2) + log (n) 0=4 (n)=log(n) b=2 log a = log 4 = 2! vii) T(n) - 4T (n/2) +1 a=4 1(n)-1 log a = log 4 =) Viii) T(n)= 2T(1/2) + log(n) 0=2 100 a = 100 2 = 1 5=2 Company of the second of the s 2x) T(n)= 2T(1/2)+n = n T(n)= O (n log n) com 2 1(n)=n X) T(n) = 2T (1/3)+4 0=2 1(0)=:

Xi) T(n) = 2T(7/3) + log(n)
0.52 $ (n)= o_0(n) \times (o_{3}^{2}) $
$b=3$ $\log \alpha = \log 2$
Xii) T(n)= 2T(1/3)+n log 2 < 1
$q=2 m =n \qquad \qquad n^{2} = n^{2} = 0 $
b=3 log a = log a
the state of the s
Exercicio 4 Determine un limite assintático para T(N). Dica: Fasa uma substituição
de vensirel. Ess m=log(n)
Se m= lack) então n=2" (pois logn=m== n=2") Propriedade do log
Substitutedo na função organil: T(2m) = 2T(2m2) (2m2)
$Seya S(m) = T(2^m)$
$S(m) = 2.5 \left(\frac{\pi}{2}\right)$
0=2 log2=1 0 <1 cm1
As b= 2 de s de sous de intestem = O (m) - o-Hum de destrace de le religion de la
$Mm = 0$ $S(m) = T(2^m) = log(2^m) = log(n)$
Exerciser 5 Determine un limite vontotro para T(n) = 2T (Vn') + log (n). Mesmo dice do a 4. Se m= log(n), enter n= 000 cremplo = log_(8)=3) -> 0=8
$T(2^m) = 2T(2^{m_2}) + \log(2^m)$ Poténcia: $(a^m)^n = a^{m \cdot n}$ = $2T(2^{m_2}) + m$ $(2^m)^{\frac{1}{2}} = 2^{m \cdot \frac{1}{2}} = 2^{m \cdot \frac{1}{2}}$
$Se S(m) = T(2^m)$
5(m)=25(%2)+m 1/m=log(n)
$\frac{\alpha=2}{m\geq 1} \qquad \frac{\theta(\log n)}{n}$
$b=2$ $\theta(m)$
(tilibra