Unit n°66

Supplement 1

$x = \sqrt{n} + \sqrt{n+k}$; $n,k \in \mathbb{N}$

rec. $x := \frac{1}{2}\left(x + \frac{2(2n+k)x^2 - k^2}{x^3}\right)$

exampl. $x(0)=2$; $n=3$; $k=1,2,3,4,...$

Find

$\lim_{t\to\infty} x(t)$ and

$\lim_{t\to\infty} dx(t) = \frac{x(t) - x(t+1)}{x(t+1) - x(t+2)}$ in funct. of k

k	$\lim_{t\to\infty} x(t,k)$	$\lim_{t\to\infty} dx(t,k)$
1	3.73205080756887729352	193.99484522385712843753
2	3.96811878506866698993	61.983866769659335081 43
3	4.18154055035205539172	33.970562748477140585 62
4	4.37780211863346788402	22.956439237389600016 4
5	4.56047793231506739113	17.302203894596786905
6	4.73205080756887729352	13.928203230275509173
7	4.8943284677372566255	11.7105251000548240
8	5.04867559792427714...	10.151492315720775...
9	5.19615242270663187...	9.00000000000000...
10	5.337602083032866...	8.1167987189750...

** **Continue this table!**

** **Find the relation between**

$\lim_{t\to\infty} dx(t,n,k)$ and $\lim_{t\to\infty} x(t,n,k)$.

Hints

$\lim_{t\to\infty} dx(t,n,1) = (\lim_{t\to\infty} x(t,n,1))^4$

$\lim_{t\to\infty} dx(t,3,9) = 9$???