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> #Not okay to post
> #Anusha Nagar, Homework 8, 10.4.2021
>
> #Problem 1
> #My RUID: 185007365
>  $f_x := \frac{(1 + 8 \cdot x)}{(5 + x)}$ ;

$$f_x := \frac{1 + 8 x}{5 + x} \tag{1}$$

>
> a := proc(n) option remember:
if n = 0 then
    1 :
else
     $\frac{(1 + 8 \cdot (n - 1))}{(5 + 1 \cdot (n - 1))}$  :
fi:
end:

evalf(seq(a(i), i = 1 .. 1000));
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> #The steady state seems to be around 7.96-8. It seems stable.

> #Problem 2

> $kI := 1$

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> k1 := 1
(3)

> k2 := 2
k2 := 2
(4)

> k3 := 2.5
k3 := 2.5
(5)

> k4 := 3.1
k4 := 3.1
(6)

> k5 := 3.5
k5 := 3.5
(7)

> b :=proc(n) option remember:
if n=0 then
 0.5 :
else
  k1·(n - 1)·(1 - (n - 1)) :
fi:
end:

evalf(seq(b(i), i=1..1000));
0., 0., -2., -6., -12., -20., -30., -42., -56., -72., -90., -110., -132., -156.,
(8)
-182., -210., -240., -272., -306., -342., -380., -420., -462., -506., -552.,
-600., -650., -702., -756., -812., -870., -930., -992., -1056., -1122.,
-1190., -1260., -1332., -1406., -1482., -1560., -1640., -1722., -1806.,
-1892., -1980., -2070., -2162., -2256., -2352., -2450., -2550., -2652.,
-2756., -2862., -2970., -3080., -3192., -3306., -3422., -3540., -3660.,
-3782., -3906., -4032., -4160., -4290., -4422., -4556., -4692., -4830.,
-4970., -5112., -5256., -5402., -5550., -5700., -5852., -6006., -6162.,
-6320., -6480., -6642., -6806., -6972., -7140., -7310., -7482., -7656.,
-7832., -8010., -8190., -8372., -8556., -8742., -8930., -9120., -9312.,
-9506., -9702., -9900., -10100., -10302., -10506., -10712., -10920., -11130.,
-11342., -11556., -11772., -11990., -12210., -12432., -12656., -12882.,
-13110., -13340., -13572., -13806., -14042., -14280., -14520., -14762.,
-15006., -15252., -15500., -15750., -16002., -16256., -16512., -16770.,
-17030., -17292., -17556., -17822., -18090., -18360., -18632., -18906.,
-19182., -19460., -19740., -20022., -20306., -20592., -20880., -21170.,
-21462., -21756., -22052., -22350., -22650., -22952., -23256., -23562.,
-23870., -24180., -24492., -24806., -25122., -25440., -25760., -26082.,
-26406., -26732., -27060., -27390., -27722., -28056., -28392., -28730.,
-29070., -29412., -29756., -30102., -30450., -30800., -31152., -31506.,
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-34782., -35156., -35532., -35910., -36290., -36672., -37056., -37442.,

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—37830., —38220., —38612., —39006., —39402., —39800., —40200., —40602.,
—41006., —41412., —41820., —42230., —42642., —43056., —43472., —43890.,
—44310., —44732., —45156., —45582., —46010., —46440., —46872., —47306.,
—47742., —48180., —48620., —49062., —49506., —49952., —50400., —50850.,
—51302., —51756., —52212., —52670., —53130., —53592., —54056., —54522.,
—54990., —55460., —55932., —56406., —56882., —57360., —57840., —58322.,
—58806., —59292., —59780., —60270., —60762., —61256., —61752., —62250.,
—62750., —63252., —63756., —64262., —64770., —65280., —65792., —66306.,
—66822., —67340., —67860., —68382., —68906., —69432., —69960., —70490.,
—71022., —71556., —72092., —72630., —73170., —73712., —74256., —74802.,
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—84390., —84972., —85556., —86142., —86730., —87320., —87912., —88506.,
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—247506., —248502., —249500., —250500., —251502., —252506., —253512.,
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—314160., —315282., —316406., —317532., —318660., —319790., —320922.,
—322056., —323192., —324330., —325470., —326612., —327756., —328902.,
—330050., —331200., —332352., —333506., —334662., —335820., —336980.,
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—406406., —407682., —408960., —410240., —411522., —412806., —414092.,
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—520562., —522006., —523452., —524900., —526350., —527802., —529256.,
—530712., —532170., —533630., —535092., —536556., —538022., —539490.,
—540960., —542432., —543906., —545382., —546860., —548340., —549822.,

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-637602., -639200., -640800., -642402., -644006., -645612., -647220.,
-648830., -650442., -652056., -653672., -655290., -656910., -658532.,
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-880782., -882660., -884540., -886422., -888306., -890192., -892080.,
-893970., -895862., -897756., -899652., -901550., -903450., -905352.,
-907256., -909162., -911070., -912980., -914892., -916806., -918722.,
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-934122., -936056., -937992., -939930., -941870., -943812., -945756.,
-947702., -949650., -951600., -953552., -955506., -957462., -959420.,
-961380., -963342., -965306., -967272., -969240., -971210., -973182.,
-975156., -977132., -979110., -981090., -983072., -985056., -987042.,
-989030., -991020., -993012., -995006., -997002.
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|> c :=proc(n) option remember :
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if  $n = 0$  then
  0.5 :
else
   $k2 \cdot (n - 1) \cdot (1 - (n - 1))$  :
fi:
end:

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evalf(seq(c(i), i=1..1000));

$$0., -4., -12., -24., -40., -60., -84., -112., -144., -180., -220., -264., -312., -364., -420., -480., -544., -612., -684., -760., -840., -924., -1012., -1104., -1200., -1300., -1404., -1512., -1624., -1740., -1860., -1984., -2112., -2244., -2380., -2520., -2664., -2812., -2964., -3120., -3280., -3444., -3612., -3784., -3960., -4140., -4324., -4512., -4704., -4900., -5100., -5304., -5512., -5724., -5940., -6160., -6384., -6612., -6844., -7080., -7320., -7564., -7812., -8064., -8320., -8580., -8844., -9112., -9384., -9660., -9940., -10224., -10512., -10804., -11100., -11400., -11704., -12012., -12324., -12640., -12960., -13284., -13612., -13944., -14280., -14620., -14964., -15312., -15664., -16020., -16380., -16744., -17112., -17484., -17860., -18240., -18624., -19012., -19404., -19800., -20200., -20604., -21012., -21424., -21840., -22260., -22684., -23112., -23544., -23980., -24420., -24864., -25312., -25764., -26220., -26680., -27144., -27612., -28084., -28560., -29040., -29524., -30012., -30504., -31000., -31500., -32004., -32512., -33024., -33540., -34060., -34584., -35112., -35644., -36180., -36720., -37264., -37812., -38364., -38920., -39480., -40044., -40612., -41184., -41760., -42340., -42924., -43512., -44104., -44700., -45300., -45904., -46512., -47124., -47740., -48360., -48984., -49612., -50244., -50880., -51520., -52164., -52812., -53464., -54120., -54780., -55444., -56112., -56784., -57460., -58140., -58824., -59512., -60204., -60900., -61600., -62304., -63012., -63724., -64440., -65160., -65884., -66612., -67344., -68080., -68820., -69564., -70312., -71064., -71820., -72580., -73344., -74112., -74884., -75660., -76440., -77224., -78012., -78804., -79600., -80400., -81204., -82012., -82824., -83640., -84460., -85284., -86112., -86944., -87780., -88620., -89464., -90312., -91164., -92020., -92880., -93744., -94612., -95484., -96360., -97240., -98124., -99012., -99904., -100800., -101700., -102604., -103512., -104424., -105340., -106260., -107184., -108112., -109044., -109980., -110920., -111864., -112812., -113764., -114720., -115680., -116644., -117612., -118584., -119560., -120540., -121524., -122512., -123504., -124500., -125500., -126504., -127512., -128524., -129540., -130560., -131584., -132612., -133644., -134680., -135720., -136764., -137812., -138864.,$$
(9)

—139920., —140980., —142044., —143112., —144184., —145260., —146340.,
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—171112., —172284., —173460., —174640., —175824., —177012., —178204.,
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—214512., —215824., —217140., —218460., —219784., —221112., —222444.,
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 $-1.009620 \times 10^6, -1.012464 \times 10^6, -1.015312 \times 10^6, -1.018164 \times 10^6, -1.021020$
 $\times 10^6, -1.023880 \times 10^6, -1.026744 \times 10^6, -1.029612 \times 10^6, -1.032484 \times 10^6,$
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 $\times 10^6, -1.049800 \times 10^6, -1.052700 \times 10^6, -1.055604 \times 10^6, -1.058512 \times 10^6,$
 $-1.061424 \times 10^6, -1.064340 \times 10^6, -1.067260 \times 10^6, -1.070184 \times 10^6, -1.073112$
 $\times 10^6, -1.076044 \times 10^6, -1.078980 \times 10^6, -1.081920 \times 10^6, -1.084864 \times 10^6,$
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 $-1.114524 \times 10^6, -1.117512 \times 10^6, -1.120504 \times 10^6, -1.123500 \times 10^6, -1.126500$
 $\times 10^6, -1.129504 \times 10^6, -1.132512 \times 10^6, -1.135524 \times 10^6, -1.138540 \times 10^6,$

$$\begin{aligned}
& -1.141560 \times 10^6, -1.144584 \times 10^6, -1.147612 \times 10^6, -1.150644 \times 10^6, -1.153680 \\
& \times 10^6, -1.156720 \times 10^6, -1.159764 \times 10^6, -1.162812 \times 10^6, -1.165864 \times 10^6, \\
& -1.168920 \times 10^6, -1.171980 \times 10^6, -1.175044 \times 10^6, -1.178112 \times 10^6, -1.181184 \\
& \times 10^6, -1.184260 \times 10^6, -1.187340 \times 10^6, -1.190424 \times 10^6, -1.193512 \times 10^6, \\
& -1.196604 \times 10^6, -1.199700 \times 10^6, -1.202800 \times 10^6, -1.205904 \times 10^6, -1.209012 \\
& \times 10^6, -1.212124 \times 10^6, -1.215240 \times 10^6, -1.218360 \times 10^6, -1.221484 \times 10^6, \\
& -1.224612 \times 10^6, -1.227744 \times 10^6, -1.230880 \times 10^6, -1.234020 \times 10^6, -1.237164 \\
& \times 10^6, -1.240312 \times 10^6, -1.243464 \times 10^6, -1.246620 \times 10^6, -1.249780 \times 10^6, \\
& -1.252944 \times 10^6, -1.256112 \times 10^6, -1.259284 \times 10^6, -1.262460 \times 10^6, -1.265640 \\
& \times 10^6, -1.268824 \times 10^6, -1.272012 \times 10^6, -1.275204 \times 10^6, -1.278400 \times 10^6, \\
& -1.281600 \times 10^6, -1.284804 \times 10^6, -1.288012 \times 10^6, -1.291224 \times 10^6, -1.294440 \\
& \times 10^6, -1.297660 \times 10^6, -1.300884 \times 10^6, -1.304112 \times 10^6, -1.307344 \times 10^6, \\
& -1.310580 \times 10^6, -1.313820 \times 10^6, -1.317064 \times 10^6, -1.320312 \times 10^6, -1.323564 \\
& \times 10^6, -1.326820 \times 10^6, -1.330080 \times 10^6, -1.333344 \times 10^6, -1.336612 \times 10^6, \\
& -1.339884 \times 10^6, -1.343160 \times 10^6, -1.346440 \times 10^6, -1.349724 \times 10^6, -1.353012 \\
& \times 10^6, -1.356304 \times 10^6, -1.359600 \times 10^6, -1.362900 \times 10^6, -1.366204 \times 10^6, \\
& -1.369512 \times 10^6, -1.372824 \times 10^6, -1.376140 \times 10^6, -1.379460 \times 10^6, -1.382784 \\
& \times 10^6, -1.386112 \times 10^6, -1.389444 \times 10^6, -1.392780 \times 10^6, -1.396120 \times 10^6, \\
& -1.399464 \times 10^6, -1.402812 \times 10^6, -1.406164 \times 10^6, -1.409520 \times 10^6, -1.412880 \\
& \times 10^6, -1.416244 \times 10^6, -1.419612 \times 10^6, -1.422984 \times 10^6, -1.426360 \times 10^6, \\
& -1.429740 \times 10^6, -1.433124 \times 10^6, -1.436512 \times 10^6, -1.439904 \times 10^6, -1.443300 \\
& \times 10^6, -1.446700 \times 10^6, -1.450104 \times 10^6, -1.453512 \times 10^6, -1.456924 \times 10^6, \\
& -1.460340 \times 10^6, -1.463760 \times 10^6, -1.467184 \times 10^6, -1.470612 \times 10^6, -1.474044 \\
& \times 10^6, -1.477480 \times 10^6, -1.480920 \times 10^6, -1.484364 \times 10^6, -1.487812 \times 10^6, \\
& -1.491264 \times 10^6, -1.494720 \times 10^6, -1.498180 \times 10^6, -1.501644 \times 10^6, -1.505112 \\
& \times 10^6, -1.508584 \times 10^6, -1.512060 \times 10^6, -1.515540 \times 10^6, -1.519024 \times 10^6, \\
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& \times 10^6, -1.540012 \times 10^6, -1.543524 \times 10^6, -1.547040 \times 10^6, -1.550560 \times 10^6, \\
& -1.554084 \times 10^6, -1.557612 \times 10^6, -1.561144 \times 10^6, -1.564680 \times 10^6, -1.568220 \\
& \times 10^6, -1.571764 \times 10^6, -1.575312 \times 10^6, -1.578864 \times 10^6, -1.582420 \times 10^6, \\
& -1.585980 \times 10^6, -1.589544 \times 10^6, -1.593112 \times 10^6, -1.596684 \times 10^6, -1.600260 \\
& \times 10^6, -1.603840 \times 10^6, -1.607424 \times 10^6, -1.611012 \times 10^6, -1.614604 \times 10^6,
\end{aligned}$$

$$\begin{aligned}
& -1.618200 \times 10^6, -1.621800 \times 10^6, -1.625404 \times 10^6, -1.629012 \times 10^6, -1.632624 \\
& \times 10^6, -1.636240 \times 10^6, -1.639860 \times 10^6, -1.643484 \times 10^6, -1.647112 \times 10^6, \\
& -1.650744 \times 10^6, -1.654380 \times 10^6, -1.658020 \times 10^6, -1.661664 \times 10^6, -1.665312 \\
& \times 10^6, -1.668964 \times 10^6, -1.672620 \times 10^6, -1.676280 \times 10^6, -1.679944 \times 10^6, \\
& -1.683612 \times 10^6, -1.687284 \times 10^6, -1.690960 \times 10^6, -1.694640 \times 10^6, -1.698324 \\
& \times 10^6, -1.702012 \times 10^6, -1.705704 \times 10^6, -1.709400 \times 10^6, -1.713100 \times 10^6, \\
& -1.716804 \times 10^6, -1.720512 \times 10^6, -1.724224 \times 10^6, -1.727940 \times 10^6, -1.731660 \\
& \times 10^6, -1.735384 \times 10^6, -1.739112 \times 10^6, -1.742844 \times 10^6, -1.746580 \times 10^6, \\
& -1.750320 \times 10^6, -1.754064 \times 10^6, -1.757812 \times 10^6, -1.761564 \times 10^6, -1.765320 \\
& \times 10^6, -1.769080 \times 10^6, -1.772844 \times 10^6, -1.776612 \times 10^6, -1.780384 \times 10^6, \\
& -1.784160 \times 10^6, -1.787940 \times 10^6, -1.791724 \times 10^6, -1.795512 \times 10^6, -1.799304 \\
& \times 10^6, -1.803100 \times 10^6, -1.806900 \times 10^6, -1.810704 \times 10^6, -1.814512 \times 10^6, \\
& -1.818324 \times 10^6, -1.822140 \times 10^6, -1.825960 \times 10^6, -1.829784 \times 10^6, -1.833612 \\
& \times 10^6, -1.837444 \times 10^6, -1.841280 \times 10^6, -1.845120 \times 10^6, -1.848964 \times 10^6, \\
& -1.852812 \times 10^6, -1.856664 \times 10^6, -1.860520 \times 10^6, -1.864380 \times 10^6, -1.868244 \\
& \times 10^6, -1.872112 \times 10^6, -1.875984 \times 10^6, -1.879860 \times 10^6, -1.883740 \times 10^6, \\
& -1.887624 \times 10^6, -1.891512 \times 10^6, -1.895404 \times 10^6, -1.899300 \times 10^6, -1.903200 \\
& \times 10^6, -1.907104 \times 10^6, -1.911012 \times 10^6, -1.914924 \times 10^6, -1.918840 \times 10^6, \\
& -1.922760 \times 10^6, -1.926684 \times 10^6, -1.930612 \times 10^6, -1.934544 \times 10^6, -1.938480 \\
& \times 10^6, -1.942420 \times 10^6, -1.946364 \times 10^6, -1.950312 \times 10^6, -1.954264 \times 10^6, \\
& -1.958220 \times 10^6, -1.962180 \times 10^6, -1.966144 \times 10^6, -1.970112 \times 10^6, -1.974084 \\
& \times 10^6, -1.978060 \times 10^6, -1.982040 \times 10^6, -1.986024 \times 10^6, -1.990012 \times 10^6, \\
& -1.994004 \times 10^6
\end{aligned}$$

> **d :=proc(n) option remember:**
if n = 0 **then**
 0.5 :
else
 k3 · (n - 1) · (1 - (n - 1)) :
fi:
end:

evalf(seq(d(i), i=1..1000));
0., -5.0, -15.0, -30.0, -50.0, -75.0, -105.0, -140.0, -180.0, -225.0, -275.0,
-330.0, -390.0, -455.0, -525.0, -600.0, -680.0, -765.0, -855.0, -950.0,
-1050.0, -1155.0, -1265.0, -1380.0, -1500.0, -1625.0, -1755.0, -1890.0,
-2030.0, -2175.0, -2325.0, -2480.0, -2640.0, -2805.0, -2975.0, -3150.0,

(10)

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 $-1.2197550 \times 10^6, -1.2232500 \times 10^6, -1.2267500 \times 10^6, -1.2302550 \times 10^6,$
 $-1.2337650 \times 10^6, -1.2372800 \times 10^6, -1.2408000 \times 10^6, -1.2443250 \times 10^6,$
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 $-2.1275150 \times 10^6, -2.1321300 \times 10^6, -2.1367500 \times 10^6, -2.1413750 \times 10^6,$
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 $-2.4132650 \times 10^6, -2.4181800 \times 10^6, -2.4231000 \times 10^6, -2.4280250 \times 10^6,$

$$\begin{aligned}
& -2.4329550 \times 10^6, -2.4378900 \times 10^6, -2.4428300 \times 10^6, -2.4477750 \times 10^6, \\
& -2.4527250 \times 10^6, -2.4576800 \times 10^6, -2.4626400 \times 10^6, -2.4676050 \times 10^6, \\
& -2.4725750 \times 10^6, -2.4775500 \times 10^6, -2.4825300 \times 10^6, -2.4875150 \times 10^6, \\
& -2.4925050 \times 10^6
\end{aligned}$$

> **e :=proc(n) option remember:**
if $n = 0$ **then**
 0.5 :
else
 $k4 \cdot (n - 1) \cdot (1 - (n - 1))$:
fi:
end:

$$\begin{aligned}
& \text{evalf}(\text{seq}(e(i), i = 1 .. 1000));
\end{aligned} \tag{11}$$

$$\begin{aligned}
& 0., 0., -6.2, -18.6, -37.2, -62.0, -93.0, -130.2, -173.6, -223.2, -279.0, -341.0, \\
& -409.2, -483.6, -564.2, -651.0, -744.0, -843.2, -948.6, -1060.2, -1178.0, \\
& -1302.0, -1432.2, -1568.6, -1711.2, -1860.0, -2015.0, -2176.2, -2343.6, \\
& -2517.2, -2697.0, -2883.0, -3075.2, -3273.6, -3478.2, -3689.0, -3906.0, \\
& -4129.2, -4358.6, -4594.2, -4836.0, -5084.0, -5338.2, -5598.6, -5865.2, \\
& -6138.0, -6417.0, -6702.2, -6993.6, -7291.2, -7595.0, -7905.0, -8221.2, \\
& -8543.6, -8872.2, -9207.0, -9548.0, -9895.2, -10248.6, -10608.2, -10974.0, \\
& -11346.0, -11724.2, -12108.6, -12499.2, -12896.0, -13299.0, -13708.2, \\
& -14123.6, -14545.2, -14973.0, -15407.0, -15847.2, -16293.6, -16746.2, \\
& -17205.0, -17670.0, -18141.2, -18618.6, -19102.2, -19592.0, -20088.0, \\
& -20590.2, -21098.6, -21613.2, -22134.0, -22661.0, -23194.2, -23733.6, \\
& -24279.2, -24831.0, -25389.0, -25953.2, -26523.6, -27100.2, -27683.0, \\
& -28272.0, -28867.2, -29468.6, -30076.2, -30690.0, -31310.0, -31936.2, \\
& -32568.6, -33207.2, -33852.0, -34503.0, -35160.2, -35823.6, -36493.2, \\
& -37169.0, -37851.0, -38539.2, -39233.6, -39934.2, -40641.0, -41354.0, \\
& -42073.2, -42798.6, -43530.2, -44268.0, -45012.0, -45762.2, -46518.6, \\
& -47281.2, -48050.0, -48825.0, -49606.2, -50393.6, -51187.2, -51987.0, \\
& -52793.0, -53605.2, -54423.6, -55248.2, -56079.0, -56916.0, -57759.2, \\
& -58608.6, -59464.2, -60326.0, -61194.0, -62068.2, -62948.6, -63835.2, \\
& -64728.0, -65627.0, -66532.2, -67443.6, -68361.2, -69285.0, -70215.0, \\
& -71151.2, -72093.6, -73042.2, -73997.0, -74958.0, -75925.2, -76898.6, \\
& -77878.2, -78864.0, -79856.0, -80854.2, -81858.6, -82869.2, -83886.0, \\
& -84909.0, -85938.2, -86973.6, -88015.2, -89063.0, -90117.0, -91177.2, \\
& -92243.6, -93316.2, -94395.0, -95480.0, -96571.2, -97668.6, -98772.2, \\
& -99882.0, -100998.0, -102120.2, -103248.6, -104383.2, -105524.0, -106671.0, \\
& -107824.2, -108983.6, -110149.2, -111321.0, -112499.0, -113683.2, -114873.6,
\end{aligned}$$

—116070.2, —117273.0, —118482.0, —119697.2, —120918.6, —122146.2, —123380.0,
—124620.0, —125866.2, —127118.6, —128377.2, —129642.0, —130913.0, —132190.2,
—133473.6, —134763.2, —136059.0, —137361.0, —138669.2, —139983.6, —141304.2,
—142631.0, —143964.0, —145303.2, —146648.6, —148000.2, —149358.0, —150722.0,
—152092.2, —153468.6, —154851.2, —156240.0, —157635.0, —159036.2, —160443.6,
—161857.2, —163277.0, —164703.0, —166135.2, —167573.6, —169018.2, —170469.0,
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—192975.0, —194525.0, —196081.2, —197643.6, —199212.2, —200787.0, —202368.0,
—203955.2, —205548.6, —207148.2, —208754.0, —210366.0, —211984.2, —213608.6,
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—250914.0, —252681.0, —254454.2, —256233.6, —258019.2, —259811.0, —261609.0,
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 $-1.0518486 \times 10^6, -1.0554632 \times 10^6, -1.0590840 \times 10^6, -1.0627110 \times 10^6,$
 $-1.0663442 \times 10^6, -1.0699836 \times 10^6, -1.0736292 \times 10^6, -1.0772810 \times 10^6,$
 $-1.0809390 \times 10^6, -1.0846032 \times 10^6, -1.0882736 \times 10^6, -1.0919502 \times 10^6,$
 $-1.0956330 \times 10^6, -1.0993220 \times 10^6, -1.1030172 \times 10^6, -1.1067186 \times 10^6,$
 $-1.1104262 \times 10^6, -1.1141400 \times 10^6, -1.1178600 \times 10^6, -1.1215862 \times 10^6,$
 $-1.1253186 \times 10^6, -1.1290572 \times 10^6, -1.1328020 \times 10^6, -1.1365530 \times 10^6,$
 $-1.1403102 \times 10^6, -1.1440736 \times 10^6, -1.1478432 \times 10^6, -1.1516190 \times 10^6,$
 $-1.1554010 \times 10^6, -1.1591892 \times 10^6, -1.1629836 \times 10^6, -1.1667842 \times 10^6,$
 $-1.1705910 \times 10^6, -1.1744040 \times 10^6, -1.1782232 \times 10^6, -1.1820486 \times 10^6,$
 $-1.1858802 \times 10^6, -1.1897180 \times 10^6, -1.1935620 \times 10^6, -1.1974122 \times 10^6,$
 $-1.2012686 \times 10^6, -1.2051312 \times 10^6, -1.2090000 \times 10^6, -1.2128750 \times 10^6,$
 $-1.2167562 \times 10^6, -1.2206436 \times 10^6, -1.2245372 \times 10^6, -1.2284370 \times 10^6,$
 $-1.2323430 \times 10^6, -1.2362552 \times 10^6, -1.2401736 \times 10^6, -1.2440982 \times 10^6,$
 $-1.2480290 \times 10^6, -1.2519660 \times 10^6, -1.2559092 \times 10^6, -1.2598586 \times 10^6,$
 $-1.2638142 \times 10^6, -1.2677760 \times 10^6, -1.2717440 \times 10^6, -1.2757182 \times 10^6,$

$$\begin{aligned} & -1.2796986 \times 10^6, -1.2836852 \times 10^6, -1.2876780 \times 10^6, -1.2916770 \times 10^6, \\ & -1.2956822 \times 10^6, -1.2996936 \times 10^6, -1.3037112 \times 10^6, -1.3077350 \times 10^6, \\ & -1.3117650 \times 10^6, -1.3158012 \times 10^6, -1.3198436 \times 10^6, -1.3238922 \times 10^6, \\ & -1.3279470 \times 10^6, -1.3320080 \times 10^6, -1.3360752 \times 10^6, -1.3401486 \times 10^6, \\ & -1.3442282 \times 10^6, -1.3483140 \times 10^6, -1.3524060 \times 10^6, -1.3565042 \times 10^6, \\ & -1.3606086 \times 10^6, -1.3647192 \times 10^6, -1.3688360 \times 10^6, -1.3729590 \times 10^6, \\ & -1.3770882 \times 10^6, -1.3812236 \times 10^6, -1.3853652 \times 10^6, -1.3895130 \times 10^6, \\ & -1.3936670 \times 10^6, -1.3978272 \times 10^6, -1.4019936 \times 10^6, -1.4061662 \times 10^6, \\ & -1.4103450 \times 10^6, -1.4145300 \times 10^6, -1.4187212 \times 10^6, -1.4229186 \times 10^6, \\ & -1.4271222 \times 10^6, -1.4313320 \times 10^6, -1.4355480 \times 10^6, -1.4397702 \times 10^6, \\ & -1.4439986 \times 10^6, -1.4482332 \times 10^6, -1.4524740 \times 10^6, -1.4567210 \times 10^6, \\ & -1.4609742 \times 10^6, -1.4652336 \times 10^6, -1.4694992 \times 10^6, -1.4737710 \times 10^6, \\ & -1.4780490 \times 10^6, -1.4823332 \times 10^6, -1.4866236 \times 10^6, -1.4909202 \times 10^6, \\ & -1.4952230 \times 10^6, -1.4995320 \times 10^6, -1.5038472 \times 10^6, -1.5081686 \times 10^6, \\ & -1.5124962 \times 10^6, -1.5168300 \times 10^6, -1.5211700 \times 10^6, -1.5255162 \times 10^6, \\ & -1.5298686 \times 10^6, -1.5342272 \times 10^6, -1.5385920 \times 10^6, -1.5429630 \times 10^6, \\ & -1.5473402 \times 10^6, -1.5517236 \times 10^6, -1.5561132 \times 10^6, -1.5605090 \times 10^6, \\ & -1.5649110 \times 10^6, -1.5693192 \times 10^6, -1.5737336 \times 10^6, -1.5781542 \times 10^6, \\ & -1.5825810 \times 10^6, -1.5870140 \times 10^6, -1.5914532 \times 10^6, -1.5958986 \times 10^6, \\ & -1.6003502 \times 10^6, -1.6048080 \times 10^6, -1.6092720 \times 10^6, -1.6137422 \times 10^6, \\ & -1.6182186 \times 10^6, -1.6227012 \times 10^6, -1.6271900 \times 10^6, -1.6316850 \times 10^6, \\ & -1.6361862 \times 10^6, -1.6406936 \times 10^6, -1.6452072 \times 10^6, -1.6497270 \times 10^6, \\ & -1.6542530 \times 10^6, -1.6587852 \times 10^6, -1.6633236 \times 10^6, -1.6678682 \times 10^6, \\ & -1.6724190 \times 10^6, -1.6769760 \times 10^6, -1.6815392 \times 10^6, -1.6861086 \times 10^6, \\ & -1.6906842 \times 10^6, -1.6952660 \times 10^6, -1.6998540 \times 10^6, -1.7044482 \times 10^6, \\ & -1.7090486 \times 10^6, -1.7136552 \times 10^6, -1.7182680 \times 10^6, -1.7228870 \times 10^6, \\ & -1.7275122 \times 10^6, -1.7321436 \times 10^6, -1.7367812 \times 10^6, -1.7414250 \times 10^6, \\ & -1.7460750 \times 10^6, -1.7507312 \times 10^6, -1.7553936 \times 10^6, -1.7600622 \times 10^6, \\ & -1.7647370 \times 10^6, -1.7694180 \times 10^6, -1.7741052 \times 10^6, -1.7787986 \times 10^6, \\ & -1.7834982 \times 10^6, -1.7882040 \times 10^6, -1.7929160 \times 10^6, -1.7976342 \times 10^6, \\ & -1.8023586 \times 10^6, -1.8070892 \times 10^6, -1.8118260 \times 10^6, -1.8165690 \times 10^6, \\ & -1.8213182 \times 10^6, -1.8260736 \times 10^6, -1.8308352 \times 10^6, -1.8356030 \times 10^6, \end{aligned}$$

$$\begin{aligned} & -1.8403770 \times 10^6, -1.8451572 \times 10^6, -1.8499436 \times 10^6, -1.8547362 \times 10^6, \\ & -1.8595350 \times 10^6, -1.8643400 \times 10^6, -1.8691512 \times 10^6, -1.8739686 \times 10^6, \\ & -1.8787922 \times 10^6, -1.8836220 \times 10^6, -1.8884580 \times 10^6, -1.8933002 \times 10^6, \\ & -1.8981486 \times 10^6, -1.9030032 \times 10^6, -1.9078640 \times 10^6, -1.9127310 \times 10^6, \\ & -1.9176042 \times 10^6, -1.9224836 \times 10^6, -1.9273692 \times 10^6, -1.9322610 \times 10^6, \\ & -1.9371590 \times 10^6, -1.9420632 \times 10^6, -1.9469736 \times 10^6, -1.9518902 \times 10^6, \\ & -1.9568130 \times 10^6, -1.9617420 \times 10^6, -1.9666772 \times 10^6, -1.9716186 \times 10^6, \\ & -1.9765662 \times 10^6, -1.9815200 \times 10^6, -1.9864800 \times 10^6, -1.9914462 \times 10^6, \\ & -1.9964186 \times 10^6, -2.0013972 \times 10^6, -2.0063820 \times 10^6, -2.0113730 \times 10^6, \\ & -2.0163702 \times 10^6, -2.0213736 \times 10^6, -2.0263832 \times 10^6, -2.0313990 \times 10^6, \\ & -2.0364210 \times 10^6, -2.0414492 \times 10^6, -2.0464836 \times 10^6, -2.0515242 \times 10^6, \\ & -2.0565710 \times 10^6, -2.0616240 \times 10^6, -2.0666832 \times 10^6, -2.0717486 \times 10^6, \\ & -2.0768202 \times 10^6, -2.0818980 \times 10^6, -2.0869820 \times 10^6, -2.0920722 \times 10^6, \\ & -2.0971686 \times 10^6, -2.1022712 \times 10^6, -2.1073800 \times 10^6, -2.1124950 \times 10^6, \\ & -2.1176162 \times 10^6, -2.1227436 \times 10^6, -2.1278772 \times 10^6, -2.1330170 \times 10^6, \\ & -2.1381630 \times 10^6, -2.1433152 \times 10^6, -2.1484736 \times 10^6, -2.1536382 \times 10^6, \\ & -2.1588090 \times 10^6, -2.1639860 \times 10^6, -2.1691692 \times 10^6, -2.1743586 \times 10^6, \\ & -2.1795542 \times 10^6, -2.1847560 \times 10^6, -2.1899640 \times 10^6, -2.1951782 \times 10^6, \\ & -2.2003986 \times 10^6, -2.2056252 \times 10^6, -2.2108580 \times 10^6, -2.2160970 \times 10^6, \\ & -2.2213422 \times 10^6, -2.2265936 \times 10^6, -2.2318512 \times 10^6, -2.2371150 \times 10^6, \\ & -2.2423850 \times 10^6, -2.2476612 \times 10^6, -2.2529436 \times 10^6, -2.2582322 \times 10^6, \\ & -2.2635270 \times 10^6, -2.2688280 \times 10^6, -2.2741352 \times 10^6, -2.2794486 \times 10^6, \\ & -2.2847682 \times 10^6, -2.2900940 \times 10^6, -2.2954260 \times 10^6, -2.3007642 \times 10^6, \\ & -2.3061086 \times 10^6, -2.3114592 \times 10^6, -2.3168160 \times 10^6, -2.3221790 \times 10^6, \\ & -2.3275482 \times 10^6, -2.3329236 \times 10^6, -2.3383052 \times 10^6, -2.3436930 \times 10^6, \\ & -2.3490870 \times 10^6, -2.3544872 \times 10^6, -2.3598936 \times 10^6, -2.3653062 \times 10^6, \\ & -2.3707250 \times 10^6, -2.3761500 \times 10^6, -2.3815812 \times 10^6, -2.3870186 \times 10^6, \\ & -2.3924622 \times 10^6, -2.3979120 \times 10^6, -2.4033680 \times 10^6, -2.4088302 \times 10^6, \\ & -2.4142986 \times 10^6, -2.4197732 \times 10^6, -2.4252540 \times 10^6, -2.4307410 \times 10^6, \\ & -2.4362342 \times 10^6, -2.4417336 \times 10^6, -2.4472392 \times 10^6, -2.4527510 \times 10^6, \\ & -2.4582690 \times 10^6, -2.4637932 \times 10^6, -2.4693236 \times 10^6, -2.4748602 \times 10^6, \\ & -2.4804030 \times 10^6, -2.4859520 \times 10^6, -2.4915072 \times 10^6, -2.4970686 \times 10^6, \end{aligned}$$

$$\begin{aligned}
& -2.5026362 \times 10^6, -2.5082100 \times 10^6, -2.5137900 \times 10^6, -2.5193762 \times 10^6, \\
& -2.5249686 \times 10^6, -2.5305672 \times 10^6, -2.5361720 \times 10^6, -2.5417830 \times 10^6, \\
& -2.5474002 \times 10^6, -2.5530236 \times 10^6, -2.5586532 \times 10^6, -2.5642890 \times 10^6, \\
& -2.5699310 \times 10^6, -2.5755792 \times 10^6, -2.5812336 \times 10^6, -2.5868942 \times 10^6, \\
& -2.5925610 \times 10^6, -2.5982340 \times 10^6, -2.6039132 \times 10^6, -2.6095986 \times 10^6, \\
& -2.6152902 \times 10^6, -2.6209880 \times 10^6, -2.6266920 \times 10^6, -2.6324022 \times 10^6, \\
& -2.6381186 \times 10^6, -2.6438412 \times 10^6, -2.6495700 \times 10^6, -2.6553050 \times 10^6, \\
& -2.6610462 \times 10^6, -2.6667936 \times 10^6, -2.6725472 \times 10^6, -2.6783070 \times 10^6, \\
& -2.6840730 \times 10^6, -2.6898452 \times 10^6, -2.6956236 \times 10^6, -2.7014082 \times 10^6, \\
& -2.7071990 \times 10^6, -2.7129960 \times 10^6, -2.7187992 \times 10^6, -2.7246086 \times 10^6, \\
& -2.7304242 \times 10^6, -2.7362460 \times 10^6, -2.7420740 \times 10^6, -2.7479082 \times 10^6, \\
& -2.7537486 \times 10^6, -2.7595952 \times 10^6, -2.7654480 \times 10^6, -2.7713070 \times 10^6, \\
& -2.7771722 \times 10^6, -2.7830436 \times 10^6, -2.7889212 \times 10^6, -2.7948050 \times 10^6, \\
& -2.8006950 \times 10^6, -2.8065912 \times 10^6, -2.8124936 \times 10^6, -2.8184022 \times 10^6, \\
& -2.8243170 \times 10^6, -2.8302380 \times 10^6, -2.8361652 \times 10^6, -2.8420986 \times 10^6, \\
& -2.8480382 \times 10^6, -2.8539840 \times 10^6, -2.8599360 \times 10^6, -2.8658942 \times 10^6, \\
& -2.8718586 \times 10^6, -2.8778292 \times 10^6, -2.8838060 \times 10^6, -2.8897890 \times 10^6, \\
& -2.8957782 \times 10^6, -2.9017736 \times 10^6, -2.9077752 \times 10^6, -2.9137830 \times 10^6, \\
& -2.9197970 \times 10^6, -2.9258172 \times 10^6, -2.9318436 \times 10^6, -2.9378762 \times 10^6, \\
& -2.9439150 \times 10^6, -2.9499600 \times 10^6, -2.9560112 \times 10^6, -2.9620686 \times 10^6, \\
& -2.9681322 \times 10^6, -2.9742020 \times 10^6, -2.9802780 \times 10^6, -2.9863602 \times 10^6, \\
& -2.9924486 \times 10^6, -2.9985432 \times 10^6, -3.0046440 \times 10^6, -3.0107510 \times 10^6, \\
& -3.0168642 \times 10^6, -3.0229836 \times 10^6, -3.0291092 \times 10^6, -3.0352410 \times 10^6, \\
& -3.0413790 \times 10^6, -3.0475232 \times 10^6, -3.0536736 \times 10^6, -3.0598302 \times 10^6, \\
& -3.0659930 \times 10^6, -3.0721620 \times 10^6, -3.0783372 \times 10^6, -3.0845186 \times 10^6, \\
& -3.0907062 \times 10^6
\end{aligned}$$

```

> f:=proc(n) option remember:
if n=0 then
  0.5 :
else
  k5·(n-1)·(1-(n-1)) :
fi:
end:

```

evalf(seq(f(i), i=0..1000));

$$\begin{aligned}
& 0.5, 0., 0., -7.0, -21.0, -42.0, -70.0, -105.0, -147.0, -196.0, -252.0, -315.0, \\
& -385.0, -462.0, -546.0, -637.0, -735.0, -840.0, -952.0, -1071.0, -1197.0, \\
& -1330.0, -1470.0, -1617.0, -1771.0, -1932.0, -2100.0, -2275.0, -2457.0, \\
& -2646.0, -2842.0, -3045.0, -3255.0, -3472.0, -3696.0, -3927.0, -4165.0, \\
& -4410.0, -4662.0, -4921.0, -5187.0, -5460.0, -5740.0, -6027.0, -6321.0, \\
& -6622.0, -6930.0, -7245.0, -7567.0, -7896.0, -8232.0, -8575.0, -8925.0, \\
& -9282.0, -9646.0, -10017.0, -10395.0, -10780.0, -11172.0, -11571.0, -11977.0, \\
& -12390.0, -12810.0, -13237.0, -13671.0, -14112.0, -14560.0, -15015.0, \\
& -15477.0, -15946.0, -16422.0, -16905.0, -17395.0, -17892.0, -18396.0, \\
& -18907.0, -19425.0, -19950.0, -20482.0, -21021.0, -21567.0, -22120.0, \\
& -22680.0, -23247.0, -23821.0, -24402.0, -24990.0, -25585.0, -26187.0, \\
& -26796.0, -27412.0, -28035.0, -28665.0, -29302.0, -29946.0, -30597.0, \\
& -31255.0, -31920.0, -32592.0, -33271.0, -33957.0, -34650.0, -35350.0, \\
& -36057.0, -36771.0, -37492.0, -38220.0, -38955.0, -39697.0, -40446.0, \\
& -41202.0, -41965.0, -42735.0, -43512.0, -44296.0, -45087.0, -45885.0, \\
& -46690.0, -47502.0, -48321.0, -49147.0, -49980.0, -50820.0, -51667.0, \\
& -52521.0, -53382.0, -54250.0, -55125.0, -56007.0, -56896.0, -57792.0, \\
& -58695.0, -59605.0, -60522.0, -61446.0, -62377.0, -63315.0, -64260.0, \\
& -65212.0, -66171.0, -67137.0, -68110.0, -69090.0, -70077.0, -71071.0, \\
& -72072.0, -73080.0, -74095.0, -75117.0, -76146.0, -77182.0, -78225.0, \\
& -79275.0, -80332.0, -81396.0, -82467.0, -83545.0, -84630.0, -85722.0, \\
& -86821.0, -87927.0, -89040.0, -90160.0, -91287.0, -92421.0, -93562.0, \\
& -94710.0, -95865.0, -97027.0, -98196.0, -99372.0, -100555.0, -101745.0, \\
& -102942.0, -104146.0, -105357.0, -106575.0, -107800.0, -109032.0, -110271.0, \\
& -111517.0, -112770.0, -114030.0, -115297.0, -116571.0, -117852.0, -119140.0, \\
& -120435.0, -121737.0, -123046.0, -124362.0, -125685.0, -127015.0, -128352.0, \\
& -129696.0, -131047.0, -132405.0, -133770.0, -135142.0, -136521.0, -137907.0, \\
& -139300.0, -140700.0, -142107.0, -143521.0, -144942.0, -146370.0, -147805.0, \\
& -149247.0, -150696.0, -152152.0, -153615.0, -155085.0, -156562.0, -158046.0, \\
& -159537.0, -161035.0, -162540.0, -164052.0, -165571.0, -167097.0, -168630.0, \\
& -170170.0, -171717.0, -173271.0, -174832.0, -176400.0, -177975.0, -179557.0, \\
& -181146.0, -182742.0, -184345.0, -185955.0, -187572.0, -189196.0, -190827.0, \\
& -192465.0, -194110.0, -195762.0, -197421.0, -199087.0, -200760.0, -202440.0, \\
& -204127.0, -205821.0, -207522.0, -209230.0, -210945.0, -212667.0, -214396.0, \\
& -216132.0, -217875.0, -219625.0, -221382.0, -223146.0, -224917.0, -226695.0, \\
& -228480.0, -230272.0, -232071.0, -233877.0, -235690.0, -237510.0, -239337.0, \\
& -241171.0, -243012.0, -244860.0, -246715.0, -248577.0, -250446.0, -252322.0, \\
& -254205.0, -256095.0, -257992.0, -259896.0, -261807.0, -263725.0, -265650.0,
\end{aligned} \tag{12}$$

$-267582.0, -269521.0, -271467.0, -273420.0, -275380.0, -277347.0, -279321.0,$
 $-281302.0, -283290.0, -285285.0, -287287.0, -289296.0, -291312.0, -293335.0,$
 $-295365.0, -297402.0, -299446.0, -301497.0, -303555.0, -305620.0, -307692.0,$
 $-309771.0, -311857.0, -313950.0, -316050.0, -318157.0, -320271.0, -322392.0,$
 $-324520.0, -326655.0, -328797.0, -330946.0, -333102.0, -335265.0, -337435.0,$
 $-339612.0, -341796.0, -343987.0, -346185.0, -348390.0, -350602.0, -352821.0,$
 $-355047.0, -357280.0, -359520.0, -361767.0, -364021.0, -366282.0, -368550.0,$
 $-370825.0, -373107.0, -375396.0, -377692.0, -379995.0, -382305.0, -384622.0,$
 $-386946.0, -389277.0, -391615.0, -393960.0, -396312.0, -398671.0, -401037.0,$
 $-403410.0, -405790.0, -408177.0, -410571.0, -412972.0, -415380.0, -417795.0,$
 $-420217.0, -422646.0, -425082.0, -427525.0, -429975.0, -432432.0, -434896.0,$
 $-437367.0, -439845.0, -442330.0, -444822.0, -447321.0, -449827.0, -452340.0,$
 $-454860.0, -457387.0, -459921.0, -462462.0, -465010.0, -467565.0, -470127.0,$
 $-472696.0, -475272.0, -477855.0, -480445.0, -483042.0, -485646.0, -488257.0,$
 $-490875.0, -493500.0, -496132.0, -498771.0, -501417.0, -504070.0, -506730.0,$
 $-509397.0, -512071.0, -514752.0, -517440.0, -520135.0, -522837.0, -525546.0,$
 $-528262.0, -530985.0, -533715.0, -536452.0, -539196.0, -541947.0, -544705.0,$
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 $-567021.0, -569842.0, -572670.0, -575505.0, -578347.0, -581196.0, -584052.0,$
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 $-2.9079120 \times 10^6, -2.9142960 \times 10^6, -2.9206870 \times 10^6, -2.9270850 \times 10^6,$
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 $-2.9591800 \times 10^6, -2.9656200 \times 10^6, -2.9720670 \times 10^6, -2.9785210 \times 10^6,$

$$\begin{aligned}
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& -3.0108960 \times 10^6, -3.0173920 \times 10^6, -3.0238950 \times 10^6, -3.0304050 \times 10^6, \\
& -3.0369220 \times 10^6, -3.0434460 \times 10^6, -3.0499770 \times 10^6, -3.0565150 \times 10^6, \\
& -3.0630600 \times 10^6, -3.0696120 \times 10^6, -3.0761710 \times 10^6, -3.0827370 \times 10^6, \\
& -3.0893100 \times 10^6, -3.0958900 \times 10^6, -3.1024770 \times 10^6, -3.1090710 \times 10^6, \\
& -3.1156720 \times 10^6, -3.1222800 \times 10^6, -3.1288950 \times 10^6, -3.1355170 \times 10^6, \\
& -3.1421460 \times 10^6, -3.1487820 \times 10^6, -3.1554250 \times 10^6, -3.1620750 \times 10^6, \\
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& -3.1954300 \times 10^6, -3.2021220 \times 10^6, -3.2088210 \times 10^6, -3.2155270 \times 10^6, \\
& -3.2222400 \times 10^6, -3.2289600 \times 10^6, -3.2356870 \times 10^6, -3.2424210 \times 10^6, \\
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& -3.2761960 \times 10^6, -3.2829720 \times 10^6, -3.2897550 \times 10^6, -3.2965450 \times 10^6, \\
& -3.3033420 \times 10^6, -3.3101460 \times 10^6, -3.3169570 \times 10^6, -3.3237750 \times 10^6, \\
& -3.3306000 \times 10^6, -3.3374320 \times 10^6, -3.3442710 \times 10^6, -3.3511170 \times 10^6, \\
& -3.3579700 \times 10^6, -3.3648300 \times 10^6, -3.3716970 \times 10^6, -3.3785710 \times 10^6, \\
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& -3.4130460 \times 10^6, -3.4199620 \times 10^6, -3.4268850 \times 10^6, -3.4338150 \times 10^6, \\
& -3.4407520 \times 10^6, -3.4476960 \times 10^6, -3.4546470 \times 10^6, -3.4616050 \times 10^6, \\
& -3.4685700 \times 10^6, -3.4755420 \times 10^6, -3.4825210 \times 10^6, -3.4895070 \times 10^6
\end{aligned}$$

> #We notice that for $k = \text{anything but } 1$, we have two points where the system tries to go to steady state - one is really high and one is a really small number

>

>

> #Problem 3

> #MY RUID: 185007365

>

> ***g :=proc(n) option remember:***

if n = 0 then

0.5 :

elif n = 1 then

0.7 :

else

$\frac{((n-1)+8\cdot(n-2))}{((n-1)+6\cdot(n-2))}$:

fi:

end:

evalf(seq(g(i), i=0..1000));

$$\begin{aligned}
& 0.5, 0.7, 1., 1.250000000, 1.266666667, 1.272727273, 1.275862069, 1.277777778, \\
& 1.279069767, 1.280000000, 1.280701754, 1.281250000, 1.281690141, 1.282051282, \\
& 1.282352941, 1.282608696, 1.282828283, 1.283018868, 1.283185841, 1.283333333, \\
& 1.283464567, 1.283582090, 1.283687943, 1.283783784, 1.283870968, 1.283950617, \\
& 1.284023669, 1.284090909, 1.284153005, 1.284210526, 1.284263959, 1.284313725, \\
& 1.284360190, 1.284403670, 1.284444444, 1.284482759, 1.284518828, 1.284552846, \\
& 1.284584980, 1.284615385, 1.284644195, 1.284671533, 1.284697509, 1.284722222, \\
& 1.284745763, 1.284768212, 1.284789644, 1.284810127, 1.284829721, 1.284848485, \\
& 1.284866469, 1.284883721, 1.284900285, 1.284916201, 1.284931507, 1.284946237, \\
& 1.284960422, 1.284974093, 1.284987277, 1.285000000, 1.285012285, 1.285024155, \\
& 1.285035629, 1.285046729, 1.285057471, 1.285067873, 1.285077951, 1.285087719, \\
& 1.285097192, 1.285106383, 1.285115304, 1.285123967, 1.285132383, 1.285140562, \\
& 1.285148515, 1.285156250, 1.285163776, 1.285171103, 1.285178236, 1.285185185, \\
& 1.285191956, 1.285198556, 1.285204991, 1.285211268, 1.285217391, 1.285223368, \\
& 1.285229202, 1.285234899, 1.285240464, 1.285245902, 1.285251216, 1.285256410, \\
& 1.285261490, 1.285266458, 1.285271318, 1.285276074, 1.285280728, 1.285285285, \\
& 1.285289747, 1.285294118, 1.285298399, 1.285302594, 1.285306705, 1.285310734, \\
& 1.285314685, 1.285318560, 1.285322359, 1.285326087, 1.285329744, 1.285333333, \\
& 1.285336856, 1.285340314, 1.285343709, 1.285347044, 1.285350318, 1.285353535, \\
& 1.285356696, 1.285359801, 1.285362854, 1.285365854, 1.285368803, 1.285371703, \\
& 1.285374554, 1.285377358, 1.285380117, 1.285382831, 1.285385501, 1.285388128, \\
& 1.285390713, 1.285393258, 1.285395764, 1.285398230, 1.285400659, 1.285403050, \\
& 1.285405405, 1.285407725, 1.285410011, 1.285412262, 1.285414481, 1.285416667, \\
& 1.285418821, 1.285420945, 1.285423038, 1.285425101, 1.285427136, 1.285429142, \\
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