A non-converging example:

```
> restart; with(plots):
> f:=x->1-x^2;
```

$$f := x \to 1 - x^2 \tag{1}$$

```
> sol:=solve({1-x^2=x},{x});
```

$$sol := \left\{x = -\frac{1}{2}\sqrt{5} - \frac{1}{2}\right\}, \left\{x = \frac{1}{2}\sqrt{5} - \frac{1}{2}\right\} \tag{2}$$

```
> evalf({sol[1],sol[2]});
```

$$\{\{x = -1.618033988\}, \{x = 0.6180339880\}\} \tag{3}$$

```
> # A[0]:=evalf(-1/2+sqrt(5)/2);
> A[0]:=0.6180339880;
```

$$A_0 := 0.6180339880 \tag{4}$$

```
> for n from 0 to 100 do
  A[n+1]:=f(A[n])
  end do;
```

$$A_1 := 0.6180339897$$
$$A_2 := 0.6180339876$$
$$A_3 := 0.6180339902$$
$$A_4 := 0.6180339870$$
$$A_5 := 0.6180339909$$
$$A_6 := 0.6180339861$$
$$A_7 := 0.6180339920$$
$$A_8 := 0.6180339847$$
$$A_9 := 0.6180339938$$
$$A_{10} := 0.6180339825$$
$$A_{11} := 0.6180339965$$
$$A_{12} := 0.6180339792$$
$$A_{13} := 0.6180340006$$
$$A_{14} := 0.6180339741$$
$$A_{15} := 0.6180340069$$
$$A_{16} := 0.6180339663$$
$$A_{17} := 0.6180340165$$
$$A_{18} := 0.6180339544$$
$$A_{19} := 0.6180340312$$
$$A_{20} := 0.6180339363$$
$$A_{21} := 0.6180340536$$
$$A_{22} := 0.6180339086$$
$$A_{23} := 0.6180340878$$
$$A_{24} := 0.6180338663$$

$$A_{25} := 0.6180341401$$
$$A_{26} := 0.6180338017$$
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$$A_{28} := 0.6180337029$$
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$$A_{31} := 0.6180345286$$
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$$A_{41} := 0.6180384831$$
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$$A_{48} := 0.6180141750$$
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$$A_{50} := 0.6180037159$$
$$A_{51} := 0.6180714071$$
$$A_{52} := 0.6179877357$$
$$A_{53} := 0.6180911585$$
$$A_{54} := 0.6179633198$$
$$A_{55} := 0.6181213354$$
$$A_{56} := 0.6179260147$$
$$A_{57} := 0.6181674404$$
$$A_{58} := 0.6178690156$$
$$A_{59} := 0.6182378796$$
$$A_{60} := 0.6177819242$$
$$A_{61} := 0.6183454941$$
$$A_{62} := 0.6176488499$$
$$A_{63} := 0.6185098982$$
$$A_{64} := 0.6174455058$$

$$A_{65} := 0.6187610474$$
$$A_{66} := 0.6171347662$$
$$A_{67} := 0.6191446803$$
$$A_{68} := 0.6166598649$$
$$A_{69} := 0.6197306110$$
$$A_{70} := 0.6159339698$$
$$A_{71} := 0.6206253448$$
$$A_{72} := 0.6148241814$$
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$$A_{80} := 0.6004584583$$
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$$A_{82} := 0.5911041580$$
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$$A_{85} := 0.6673882649$$
$$A_{86} := 0.5545929039$$
$$A_{87} := 0.6924267109$$
$$A_{88} := 0.5205452500$$
$$A_{89} := 0.7290326427$$
$$A_{90} := 0.4685114059$$
$$A_{91} := 0.7804970625$$
$$A_{92} := 0.3908243354$$
$$A_{93} := 0.8472563389$$
$$A_{94} := 0.2821566962$$
$$A_{95} := 0.9203875988$$
$$A_{96} := 0.1528866680$$
$$A_{97} := 0.9766256668$$
$$A_{98} := 0.0462023069$$
$$A_{99} := 0.9978653468$$
$$A_{100} := 0.0042647497$$
$$A_{101} := 0.9999818119 \quad \textbf{(5)}$$

```
> L:=[seq(seq([A[n],A[n+i]],i=0..1),n=1..99)]:
  L1:=[[A[0],A[1]],op(L)];
```

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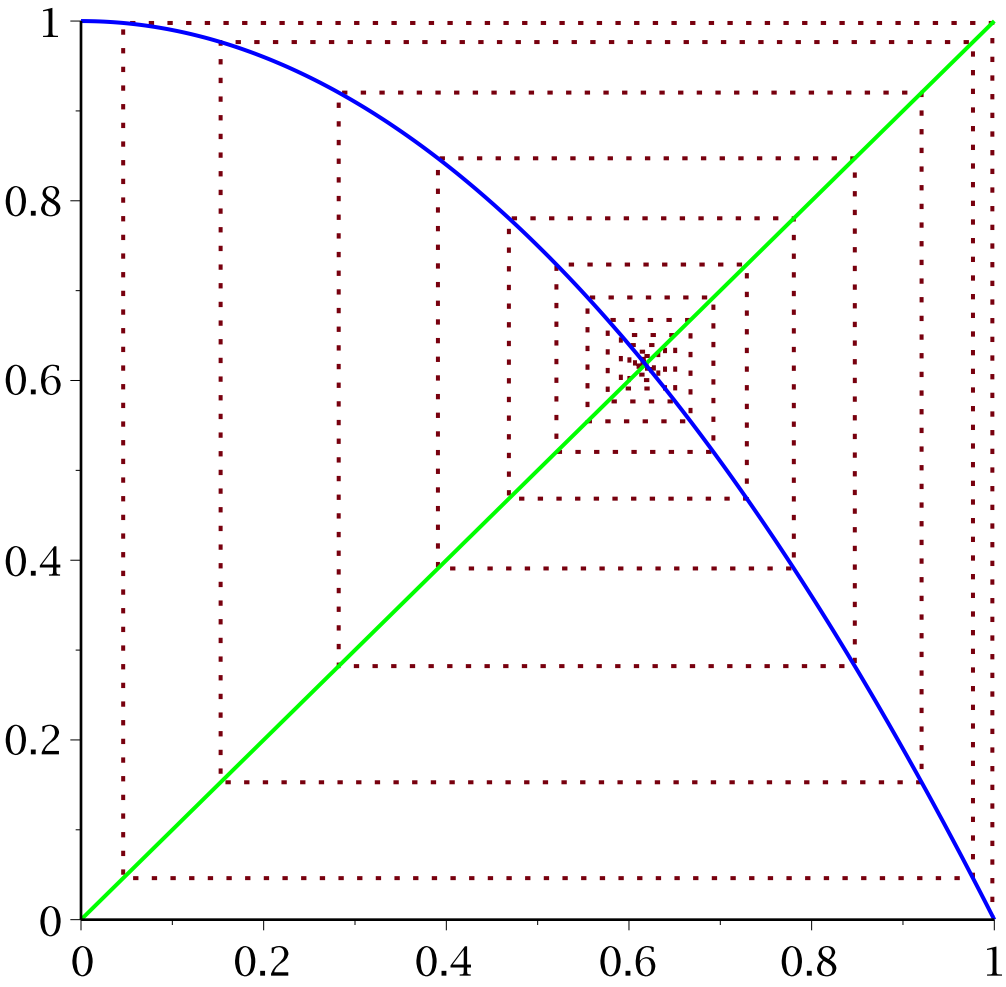
    [0.9978653468, 0.0042647497]]
> G1:=plot(L1,linestyle=[DOT]):
> G2:=plot({x,1-x^2},x=0..1,color=[green,blue]):
> display([G1,G2]);
```



And a converging example:

```
> g:=x->cos(x); A[0]:=1.5;
> #g:=x->x+(1/6)*x^2-(1/2): A[0]:=1.0:
```

$$g := x \to \cos(x)$$
$$A_0 := 1.5$$

(7)

```
> for n from 0 to 24 do
  A[n+1]:=g(A[n])
  end do;
```

$$A_1 := 0.07073720167$$
$$A_2 := 0.9974991672$$

$$A_3 := 0.5424049923$$
$$A_4 := 0.8564697090$$
$$A_5 := 0.6551088017$$
$$A_6 := 0.7929816458$$
$$A_7 := 0.7017241683$$
$$A_8 := 0.7637303113$$
$$A_9 := 0.7222610821$$
$$A_{10} := 0.7503128857$$
$$A_{11} := 0.7314755580$$
$$A_{12} := 0.7441895867$$
$$A_{13} := 0.7356370983$$
$$A_{14} := 0.7414033729$$
$$A_{15} := 0.7375215545$$
$$A_{16} := 0.7401374748$$
$$A_{17} := 0.7383758542$$
$$A_{18} := 0.7395627261$$
$$A_{19} := 0.7387633366$$
$$A_{20} := 0.7393018610$$
$$A_{21} := 0.7389391254$$
$$A_{22} := 0.7391834780$$
$$A_{23} := 0.7390188834$$
$$A_{24} := 0.7391297583$$
$$A_{25} := 0.7390550725 \quad (8)$$

```
> L2:=[seq(seq([A[n],A[n+i]],i=0..1),n=1..23)]:
  L3:=[[A[0],A[1]],op(L2)];
```

$L3 :=$ [[1.5, 0.07073720167], [0.07073720167, 0.07073720167], (9)
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    [0.7390188834, 0.7391297583]]
> H1:=plot(L3,linestyle=[DOT]):
> H2:=plot({x,g(x)},x=0..1.6,color=[green,blue]):
> # H2:=plot({x,g(x)},x=-2..2,color=[green,blue]):
> display([H1,H2]);
```