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%Code solves the fixed point iteration problem  $g(x) = 0.1x + 1$  using
%steffensens method.

clear all;
close all;

%tolerance
tol = 1e-8;

%intial guess
x0 = 0;

kmax = 20;

%function g(x,y)
g=@(x) 0.1*x+1;

fprintf('Below is the solution for the fixed point problem;\n');

fprintf('      k      x_k      e_n\n');

[xroot, en] = steffensens(g,x0,tol,kmax)

fprintf('We get convergence in one step since  $x_k = x_{root}$  is achived only in one step  $k=1$ \n');

fprintf('In this case we require only one iteration to converge to the true solution while \n in 1(e) we require atleast k = 8 iterations dependi

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Below is the solution for the fixed point problem;
      k      x_k      e_n
  1 1.1111111111111112e+00,  1.1111e+00
Tolerance achived

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xroot =
```

```
1.1111
```

```
en =
```

```
1.1111
```

```

We get convergence in one step since  $x_k = x_{root}$  is achived only in one step  $k=1$ 
In this case we require only one iteration to converge to the true solution while
in 1(e) we require atleast k = 8 iterations depending on the the magnitude of  $\log|e_0|$ .

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