```
function [x, r] = solveTridiagonal(a, d, c, b)
   n = length(b);
   x = zeros(n,1);
   r = zeros(n,1);
   for i = 2:n
       m = a(i) / d(i-1);
       d(i) = d(i) - m*c(i-1);
       b(i) = b(i) - m*b(i-1);
   end
   x(n) = b(n) / d(n);
   for i = n-1:-1:1
       x(i) = (b(i) - c(i)*x(i+1)) / d(i);
   end
   r = sum(a.*x-b);
end
```

```
>> a = -1 * ones(1,50);
d = 5 * ones(1,50);
c = -1 * ones(1,50);
b = (1:50).';
[x, r] = solveTridiagonal(a, d, c, b);

x =

   0.3333
   0.6667
   1.0000
   1.3333
   1.6667
   2.0000
   2.3333
   2.6667
   3.0000
   3.3333
   3.6667
   4.0000
   4.3333
   4.6667
   5.0000
   5.3333
   5.6667
   6.0000
   6.3333
   6.6667
   7.0000
```

7.3333
7.6667
8.0000
8.3333
8.6667
9.0000
9.3333
9.6667
10.0000
10.3333
10.6667
11.0000
11.3333
11.6667
12.0000
12.3333
12.6667
13.0000
13.3333
13.6667
14.0000
14.3333
14.6664
14.9986
15.3266
15.6344
15.8454
15.5928
13.1186

r =

1.0e+03 *

Columns 1 through 13

-0.4705 -0.5305 -0.5934 -0.6566 -0.7198 -0.7830 -0.8462 -0.9094 -0.9725 -1.0357 -1.0989 -1.1621 -1.2253

Columns 14 through 26

-1.2885 -1.3517 -1.4149 -1.4780 -1.5412 -1.6044 -1.6676 -1.7308 -1.7940 -1.8572 -1.9204 -1.9836 -2.0467

Columns 27 through 39

-2.1099 -2.1731 -2.2363 -2.2995 -2.3627 -2.4259 -2.4891 -2.5522 -2.6154 -2.6786 -2.7418 -2.8050 -2.8682

Columns 40 through 50

-2.9314 -2.9946 -3.0578 -3.1209 -3.1841 -3.2473 -3.3105 -3.3737 -3.4369 -3.5001 -3.5633