

Python 3.7.4 (default, Aug 9 2019, 18:34:13) [MSC v.1915 64 bit (AMD64)]  
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IPython 7.8.0 -- An enhanced Interactive Python.

In [1]:

```
runfile('D:/_First_Semester_of_Senior_Year/Numerical_Analysis(1)/homeworks/hw1/codes/hw1_3.py',
wdir='D:/_First_Semester_of_Senior_Year/Numerical_Analysis(1)/homeworks/hw1/codes')
```

tolerate value = 0.001

----- (a) -----

```
01 : 1 0.6375398756657026
02 : 1.9523809523809523 0.292339757252086
03 : 2.1217542737896267 0.23094868211538497
04 : 2.242849692023859 0.1870564217658913
05 : 2.334839672527244 0.15371372199512492
06 : 2.4070933802042798 0.12752463412689247
07 : 2.465059287507692 0.10651430415854733
08 : 2.512243462947621 0.08941192206197938
09 : 2.551057096383374 0.07534352766099053
10 : 2.583237767202747 0.0636793177146394
11 : 2.610081444615138 0.05394955506215438
12 : 2.632580300988204 0.04579461678379341
13 : 2.651509504414566 0.038933535356325044
14 : 2.667484487618559 0.033143240957967494
15 : 2.6810002018890304 0.02824433348302552
16 : 2.6924588873718474 0.024091016918216086
17 : 2.702190249310728 0.020563786259907384
18 : 2.710466452525252 0.017563992613755006
19 : 2.717513483076536 0.015009725043949105
20 : 2.7235199021356973 0.012832637644961595
21 : 2.7286436885337966 0.010975469390044143
22 : 2.733017654464709 0.009390081154891679
23 : 2.7367537784807086 0.008035885179524091
24 : 2.739946704897569 0.0068785766734786
25 : 2.742676593051374 0.00588910107383166
26 : 2.7450114536058443 0.00504280722695515
27 : 2.747009075988443 0.004318748769785488
28 : 2.748718626937001 0.003699104720415233
29 : 2.750181982351313 0.003168696734998448
30 : 2.7514348413360428 0.0027145853116200156
31 : 2.7525076612388197 0.0023257308762711674
32 : 2.753426444758921 0.001992708487338976
33 : 2.7542134042130884 0.001707467065735409
34 : 2.754887523357019 0.0014631257570101267
35 : 2.755465033456749 0.0012538013744577367
36 : 2.7559598173516564 0.0010744619423909837
37 : 2.756383752878738 0.0009208022185352455
```

----- (b) -----

```
01 : 1 0.6375398756657026
02 : 7.666666666666667 1.7788609532296136
03 : 5.2302037387103555 0.8957402974266627
04 : 3.7426969186952115 0.3565783904958582
05 : 2.9948535682764033 0.08551499672047944
06 : 2.777022225866664 0.006559821266738485
07 : 2.7590418664232454 4.265794730158707e-05
```

----- (c) -----

```
01 : 1 0.6375398756657026
02 : 0.0 1.0
03 : 0.0 1.0
04 : 0.0 1.0
```

```
05 : 0.0 1.0
06 : 0.0 1.0
07 : 0.0 1.0
08 : 0.0 1.0
09 : 0.0 1.0
10 : 0.0 1.0
11 : 0.0 1.0
12 : 0.0 1.0
13 : 0.0 1.0
14 : 0.0 1.0
15 : 0.0 1.0
16 : 0.0 1.0
17 : 0.0 1.0
18 : 0.0 1.0
19 : 0.0 1.0
20 : 0.0 1.0
21 : 0.0 1.0
22 : 0.0 1.0
23 : 0.0 1.0
24 : 0.0 1.0
25 : 0.0 1.0
26 : 0.0 1.0
27 : 0.0 1.0
28 : 0.0 1.0
29 : 0.0 1.0
30 : 0.0 1.0
31 : 0.0 1.0
32 : 0.0 1.0
33 : 0.0 1.0
34 : 0.0 1.0
35 : 0.0 1.0
36 : 0.0 1.0
37 : 0.0 1.0
38 : 0.0 1.0
39 : 0.0 1.0
40 : 0.0 1.0
41 : 0.0 1.0
```

```
------(d)-----
01 : 1 0.6375398756657026
02 : 4.58257569495584 0.6610009561650232
03 : 2.1406951429280725 0.22408337233246423
04 : 3.132075594919797 0.1352525095590482
05 : 2.5893665274210145 0.06145788652391112
06 : 2.847822274447193 0.03222201567811121
07 : 2.715521252632272 0.015731829138479647
08 : 2.7808850947101225 0.007959957188025472
09 : 2.748008838379827 0.00395637476909969
10 : 2.764398093397935 0.0019840766425103067
11 : 2.7561912839020932 0.0009905645477404227
```

In [2]: