

```

1  y'(x) = x + y
2  y(0) = 2
3
4  euler's method:
5  y'(0) = 2
6  y(0.5) = 2 + 2*0.5
7          = 3
8  y'(0.5) = 0.5 + 3
9          = 3.5
10 y(1) = 3 + 3.5*0.5
11      = 4.75
12
13 modified euler:
14 y'(0) = 2
15 y*(0.5) = 2 + 2*0.5 = 3
16 y*'(0.5) = 3.5
17 y(0.5) = 2 + 0.25(2 + 3.5)
18         = 3.375
19 y'(0.5) = 3.875
20 y*(1) = 3.375 + 0.5*3.875 = 5.3125
21 y*'(1) = 6.3125
22 y(1) = 3.375 + 0.25(3.875 + 6.3125)
23      = 5.921875
24
25 real y(x) = 3e^x - x - 1
26 y(0.5) = 3.44616
27 y(1) = 6.15485
28
29 error:
30 euler:
31 absolute error(0.5) = |3-3.44616| = 0.44616
32 relative error(0.5) = 0.44616/3.44616 ~= 0.12947
33 absolute error(1) = |4.75-6.15485| = 1.40485
34 relative error(1) = 1.40485/6.15485 ~= 0.22825
35
36 modified euler:
37 absolute error(0.5) = |3.375-3.44616| = 0.07116
38 relative error(0.5) = 0.07116/3.44616 ~= 0.02065
39 absolute error(1) = |5.921875-6.15485| = 0.232975
40 relative error(1) = 0.232975/6.15485 ~= 0.03785
41

```