Notes on Chapter 1 Problems

C. To avoid making multiple output files I did not submit pictures of the triangle/star/snowflake. Each can easily be generated by setting the "level" variable to 0, 1, or any number above 1, respectively.

D. The perimeter appears to be unbounded while the area appears to asymptotically approach 0.7

15.

Estimated values of the zeroth-order Bessel function:

x	Estimated $J_0(x)$	MATLAB value (besselj)	Difference in values
0.3	0.9775	0.9776	0.0001
0.9	0.8092	0.8075	-0.0017
1.1	0.7217	0.7196	0.0021
1.5	0.4835	0.5118	0.0283
2	0.0832	0.2239	0.1407

Problem 15 uses the files intrpf.m and chap1_problem15.m.

16.

x	Estimated $J_0(x)$	MATLAB value (besselj)	Difference in values
0.3	0.9772	0.9776	0.0004
0.9	0.8120	0.8075	-0.0045
1.1	0.7238	0.7196	-0.0042
1.5	0.5106	0.5118	0.0012
2	0.1854	0.2239	0.0385

The estimates are generally similar to problem 15's but perform better than 15 at higher values of x.

Problem 16 uses the files intrpf_2.m and chap1_problem16.m