Problem 2 a:

```
C:\Users\lab\Dropbox\Computational Physics\Jinesh_HW3>python -i prob2a.py
>>> Trapezoidal_Rule(2)
0.3252319078064746
>>> Trapezoidal_Rule(4)
0.5122828507233315
>>> Trapezoidal_Rule()
Traceback (most recent call last):
  File "<stdin>", line 1, in <module>
TypeError: Trapezoidal_Rule() takes exactly 1 argument (0 given)
>>> Trapezoidal_Rule(8)
0.40299744847824825
>>> Trapezoidal_Rule(16)
0.43010336929474696
>>> Trapezoidal_Rule(32)
0.4484146657874698
>>> Trapezoidal_Rule(64)
0.45391293121537596
>>>
```

This is the result of inputting the values suggested.

```
>>> calculate_e_2(2)
0.0623503143056
>>> calculate_e_2(4)
-0.036428467415
>>> calculate_e_2(8)
0.00903530693883
>>> calculate_e_2(16)
0.00610376549757
>>> calculate_e_2(32)
0.00183275514264
>>> calculate_e_2(64)
0.000478524385809
>>>
```

These are the errors with the respective number of steps.

Problem 2 b:

The following was the result of the Romberg approximations put in table form.

```
C:\Users\lab\Dropbox\Computational Physics\Jinesh_HW3>python -i Prob2b.py
>>> romberg(16)
[ 0.14797948]
[ 0.32523191  0.38431605]
[ 0.51228285  0.57463317  0.58732097]
[ 0.40299745  0.36656898  0.35269804  0.34897386]
[ 0.43010337  0.43913868  0.44397666  0.44542552  0.44580376]
[ 0.44841467  0.45451843  0.45554375  0.45572735  0.45576775  0.45577749]
[ 0.45391293  0.45574569  0.4558275   0.45583201  0.45583242  0.45583248
  0.45583249]
[ 0.4553485   0.45582703  0.45583245  0.45583253  0.45583253  0.45583253
  0.45583253  0.45583253]
[ 0.45571127  0.45583219  0.45583253  0.45583253  0.45583253  0.45583253
  0.45583253  0.45583253  0.45583253]
[ 0.4558022   0.45583251  0.45583253  0.45583253  0.45583253  0.45583253
  0.45583253  0.45583253  0.45583253  0.45583253]
[ 0.45582495  0.45583253  0.45583253  0.45583253  0.45583253  0.45583253
  0.45583253  0.45583253  0.45583253  0.45583253  0.45583253]
[ 0.45583064  0.45583253  0.45583253  0.45583253  0.45583253  0.45583253
  0.45583253  0.45583253  0.45583253  0.45583253  0.45583253  0.45583253]
[ 0.45583206  0.45583253  0.45583253  0.45583253  0.45583253  0.45583253
  0.45583253  0.45583253  0.45583253  0.45583253  0.45583253  0.45583253
  0.45583253]
[ 0.45583241  0.45583253  0.45583253  0.45583253  0.45583253  0.45583253
  0.45583253  0.45583253  0.45583253  0.45583253  0.45583253  0.45583253
  0.45583253  0.45583253]
[ 0.4558325   0.45583253  0.45583253  0.45583253  0.45583253  0.45583253
  0.45583253  0.45583253  0.45583253  0.45583253  0.45583253  0.45583253
  0.45583253  0.45583253  0.45583253]
[ 0.45583252  0.45583253  0.45583253  0.45583253  0.45583253  0.45583253
  0.45583253  0.45583253  0.45583253  0.45583253  0.45583253  0.45583253
  0.45583253  0.45583253  0.45583253  0.45583253]
```