PJ01_1

November 11, 2018

In [39]:
```
%matplotlib inline
```

In [40]:
```
import numpy as np
import matplotlib.pyplot as plt
```

In [77]:
```
t=np.linspace(0,1,64)
print(t)
```

```
[0.         0.01587302 0.03174603 0.04761905 0.06349206 0.07936508
 0.0952381  0.11111111 0.12698413 0.14285714 0.15873016 0.17460317
 0.19047619 0.20634921 0.22222222 0.23809524 0.25396825 0.26984127
 0.28571429 0.3015873  0.31746032 0.33333333 0.34920635 0.36507937
 0.38095238 0.3968254  0.41269841 0.42857143 0.44444444 0.46031746
 0.47619048 0.49206349 0.50793651 0.52380952 0.53968254 0.55555556
 0.57142857 0.58730159 0.6031746  0.61904762 0.63492063 0.65079365
 0.66666667 0.68253968 0.6984127  0.71428571 0.73015873 0.74603175
 0.76190476 0.77777778 0.79365079 0.80952381 0.82539683 0.84126984
 0.85714286 0.87301587 0.88888889 0.9047619  0.92063492 0.93650794
 0.95238095 0.96825397 0.98412698 1.        ]
```

In [78]:
```
y=np.ones_like(t)
```

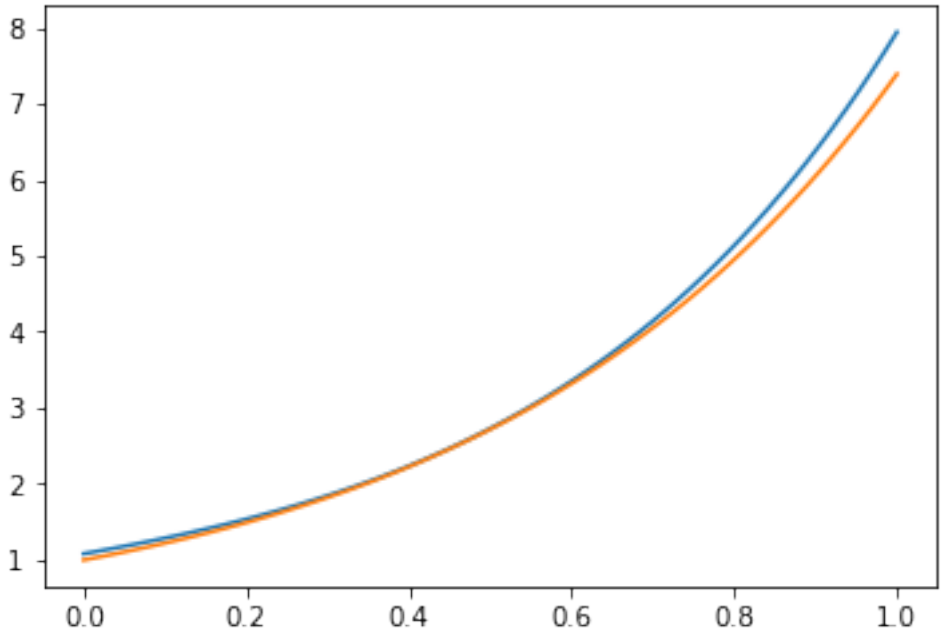
In [79]:
```
yt=np.ones_like(t)
for _ in range(5):
    for i in range(len(yt)):
        yt[i]=np.trapz((t-t[i])*y,t)
    yt+=np.exp(2*t)+(np.exp(2)-1)*t/2-(np.exp(2)+1)/4
    print(np.linalg.norm(yt-y))
    y=yt
```

```
23.910362645211556
0.0
0.0
0.0
0.0
```

In [80]:
```
np.linalg.norm(yt)
```

```
Out[80]: 30.787046523359628
```

```
In [81]: plt.plot(t,yt)
         plt.plot(t,np.exp(2*t))
         plt.show()
```




```
In [82]: print(yt[0]-np.exp(0))
         print(yt[63]-np.exp(2))
         print(yt[16]-np.exp(2*0.25))
         print(yt[48]-np.exp(2*0.75))
```

```
0.08178899840780485
0.5530944761176269
0.04664227112501518
0.249409030900833
```