

proj1_a

September 10, 2016

```
In [1]: %pylab inline
pylab.rcParams['figure.figsize'] = (10, 6)
matplotlib.rcParams.update({'font.size': 16})
matplotlib.rcParams.update({'axes.labelsize': 20})
matplotlib.rcParams.update({'xtick.labelsize': 12})
matplotlib.rcParams.update({'ytick.labelsize': 12})
matplotlib.rcParams.update({
    'font.family': 'Helvetica, Arial, sans-serif'
})

%config InlineBackend.figure_format = 'retina'
```

Populating the interactive namespace from numpy and matplotlib

```
In [2]: names = ['z', 'p4', 'p8', 'p12',
                'f', 'err4', 'err8', 'err12']
v = {}
for name in names:
    v[name] = loadtxt('../data/a/' + name + '.txt')
```

```
In [3]: # Plot ex, p4(x), p8(x) and p12(x)
# in the same figure window with different colors.
# Add a legend, axis labels and title to the plot.
```

```
pylab.plot(v['z'], v['p4'],
           v['z'], v['p8'],
           v['z'], v['p12'],
           v['z'], v['f'])

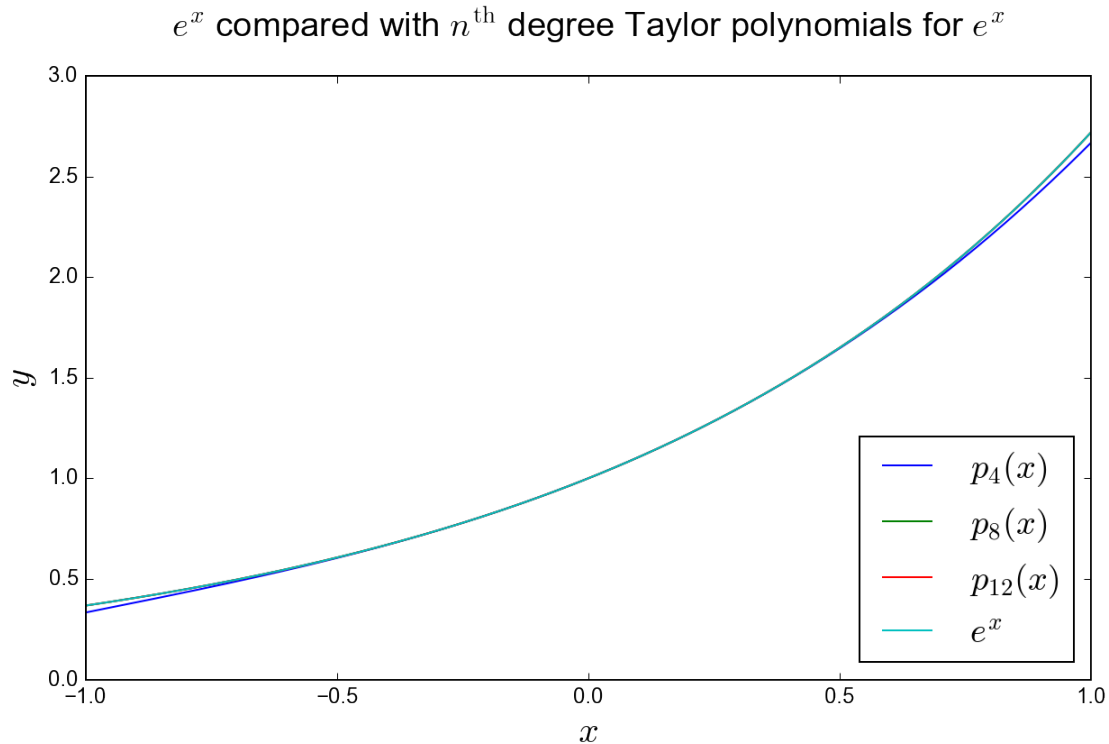
pylab.legend(('p4(x)',
             'p8(x)',
             'p12(x)',
             'ex'), loc=4)

pylab.xlabel('x')
pylab.ylabel('y')
```

```
pylab.title('$e^x$ compared with $n^{\mathrm{th}}$  

           'degree Taylor polynomials for $e^x$', y=1.05)
```

Out[3]: <matplotlib.text.Text at 0x106a37278>



```
In [4]: # Plot  $|e^x - p_4(x)|$ ,  $|e^x - p_8(x)|$  and  $|e^x - p_{12}(x)|$  in another  

        # figure window using the matplotlib command semilogy,  

        # again with a legend, axis labels and a title.
```

```
pylab.semilogy(v['z'], v['err4'],  

              v['z'], v['err8'],  

              v['z'], v['err12'])

pylab.legend((' $\epsilon_{4}$ ',  

             '$\epsilon_{8}$ ',  

             '$\epsilon_{12}$ '), loc=2)

pylab.xlabel('$x$')  

pylab.ylabel('$|e^x - p_n(x)|$')  

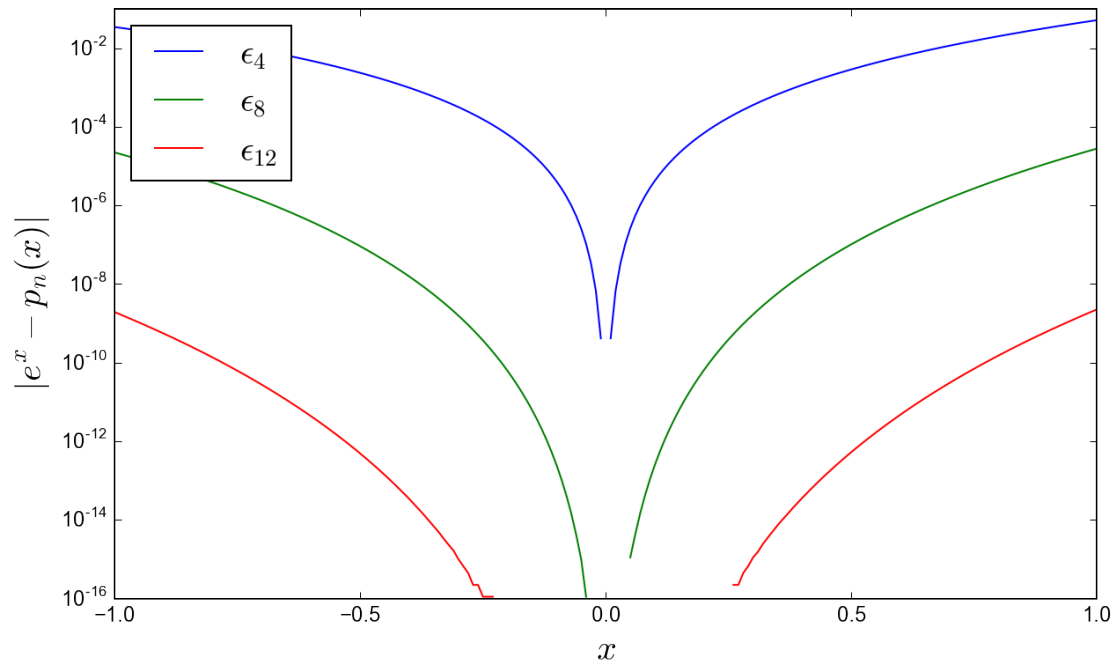
pylab.title('The absolute error over $x$ of '  

           '$n^{\mathrm{th}}$ degree Taylor polynomials '  

           'for $e^x$', y=1.05)
```

Out[4]: <matplotlib.text.Text at 0x10707f588>

The absolute error over x of n^{th} degree Taylor polynomials for e^x



In [5]: