proj1_b

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 = ['n', 'h', 'r', 'bigr']
v = {}
for name in names:
    v[name] = loadtxt('../data/b/' + name + '.txt')
```

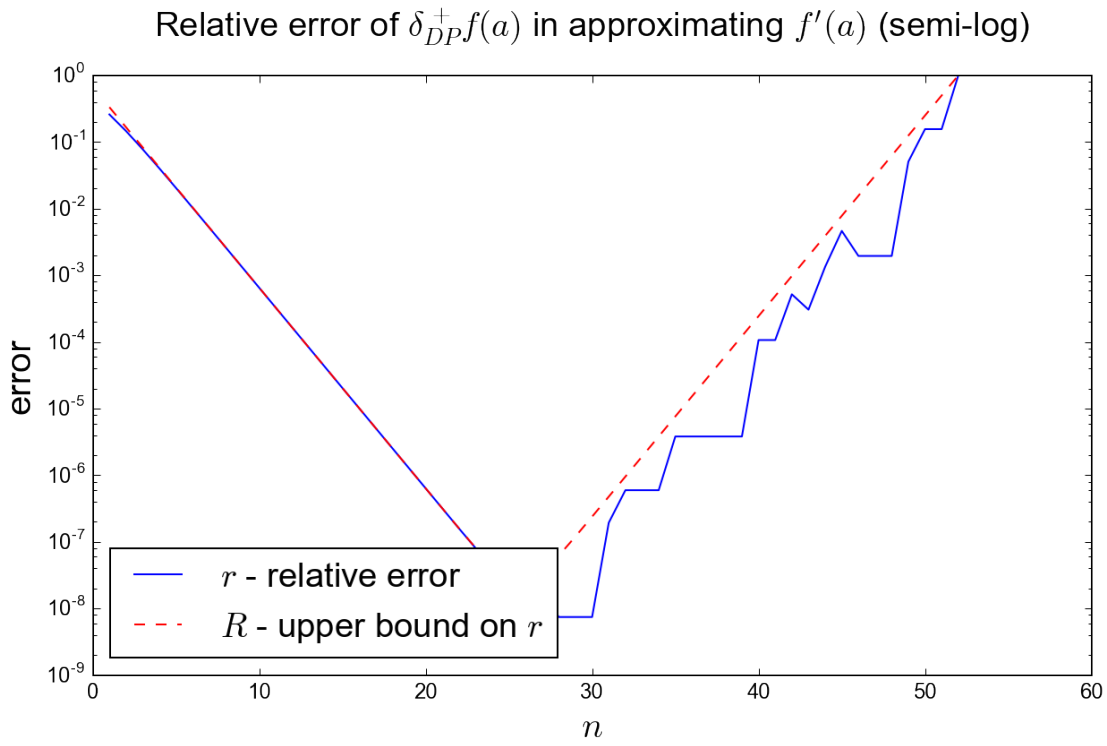
In [3]:
```
# create a semilogy plot that overlays r versus n with
# a solid blue line, and R versus n with a red dashed
# line...

pylab.semilogy(v['n'], v['r'], '-b')
pylab.semilogy(v['n'], v['bigr'], '--r')

pylab.legend(('$r$ - relative error',
              '$R$ - upper bound on $r$'), loc=3)

pylab.xlabel('$n$')
pylab.ylabel('error')
pylab.title('Relative error of $\delta^+_{DP}f(a)$ in approximating $f\'(a)
```

Out[3]:
```
<matplotlib.text.Text at 0x1096a8048>
```



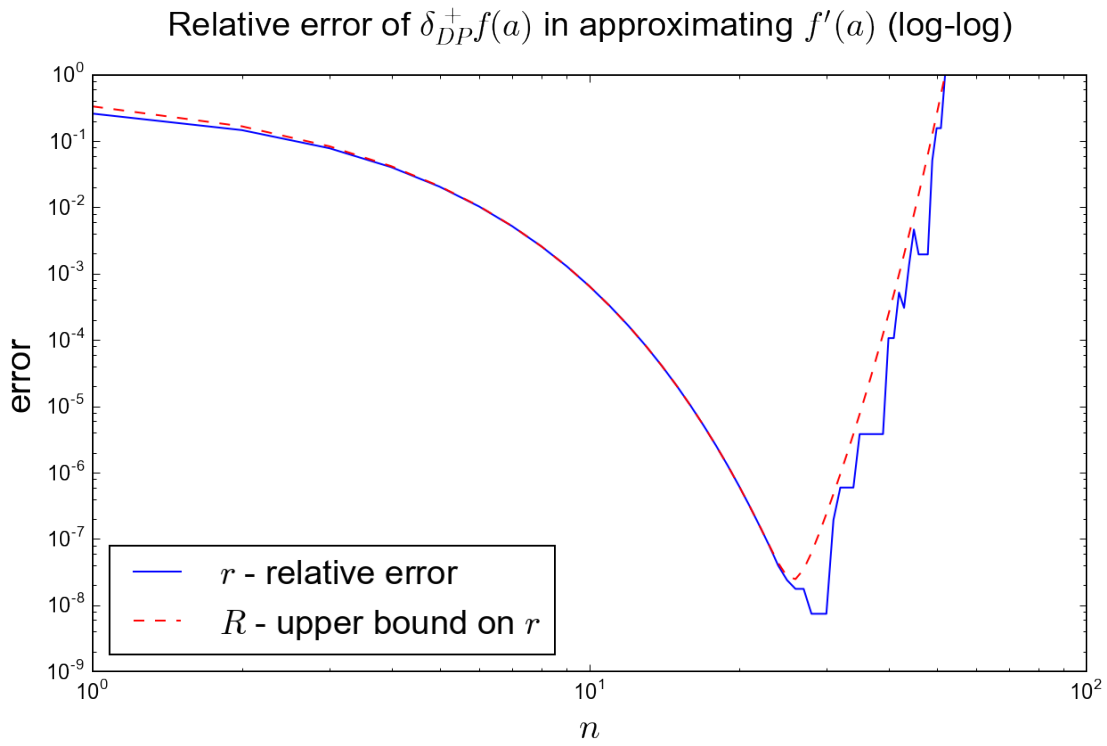

```
In [4]: # create a different loglog plot that overlays
        # r versus h with a solid blue line, and
        # R versus h with a red dashed line...

        pylab.loglog(v['n'], v['r'], '-b')
        pylab.loglog(v['n'], v['bigr'], '--r')

        pylab.legend(('$r$ - relative error',
                      '$R$ - upper bound on $r$'), loc=3)

        pylab.xlabel('$n$')
        pylab.ylabel('error')
        pylab.title('Relative error of $\delta^+_{DP}f(a)$ in approximating $f\'(a)

Out[4]: <matplotlib.text.Text at 0x109e2d7b8>
```


Relative error of $\delta^{+}_{DP} f(a)$ in approximating $f'(a)$ (log-log)
error
10^{0}
10^{-1}
10^{-2}
10^{-3}
10^{-4}
10^{-5}
10^{-6}
10^{-7}
10^{-8}
10^{-9}
10^{0}
10^{1}
10^{2}
n
r - relative error
R - upper bound on r

In [5]: