EE2703 Applied Programming Lab Final Exam

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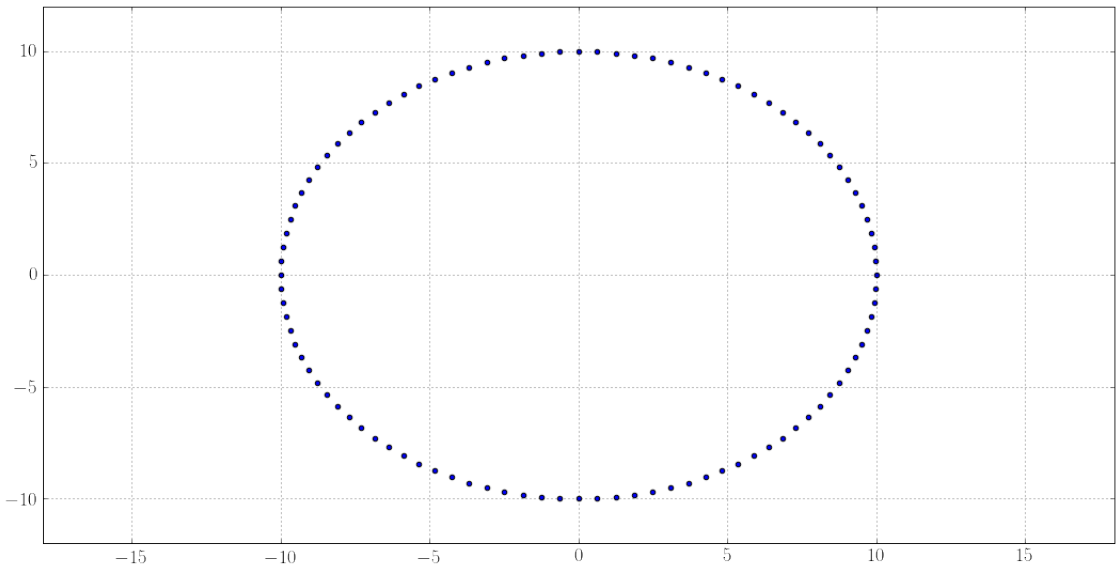
1 Introduction

This is the final exam. omgomgomg

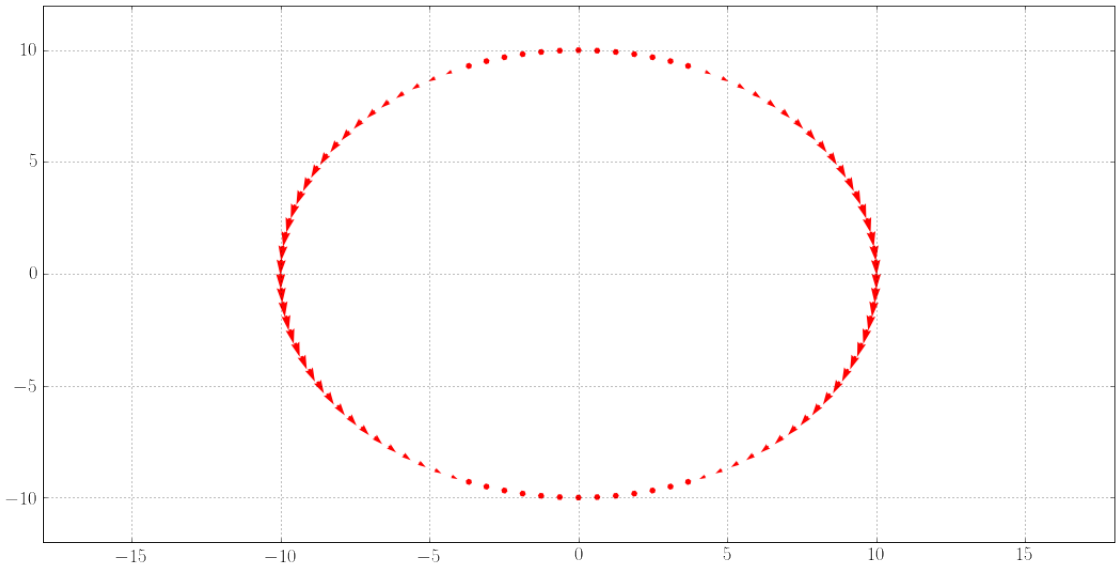
2 Current elements

```
N = 100
a = 10
phi_ = linspace(0,2*pi,N+1)[:-1]
r_ = c_[a*cos(phi_),a*sin(phi_),zeros(N)]

scatter(r_[:,0],r_[:,1])
xlim(-18,18)
ylim(-12,12)
grid()
```



```
I =  c_[a*cos(phi_)*sin(phi_),-a*cos(phi_)*cos(phi_),zeros(N)]
```




```
x = arange(3)-1
z = arange(1,1001,1)
xx,yy,zz = meshgrid(x,x,z)
print(xx.shape)
r = zeros((3,3,1000,3))
r[:,:,:,0]=xx
r[:,:,:,1]=yy
r[:,:,:,2]=zz
print(r.shape)
print(r[2,0,23])
```

```
(3, 3, 1000)
(3, 3, 1000, 3)
[ -1.   1.  24.]
```

```
R=norm(tile(r,100).reshape(3,3,1000,100,3)-r_,axis=-1)
R.shape
```

```
Out[9]: (3, 3, 1000, 100)
```

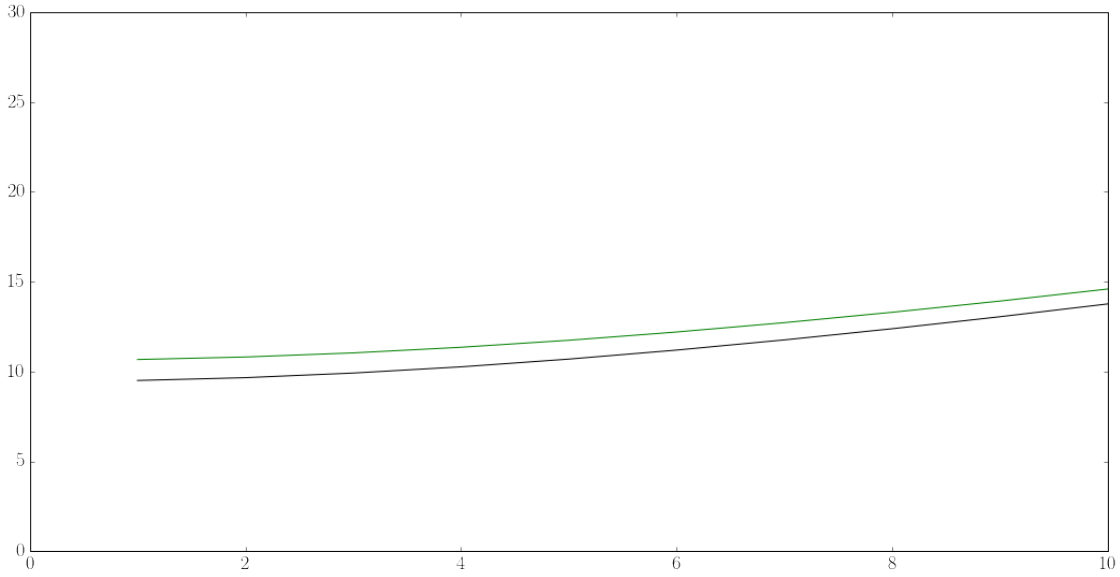
Column 1	Column 2
foo	bar
baz	qux
quux	quuz

```
norm([1,1,1])
```

```
Out[10]: 1.7320508075688772
```

```
plot(z,R[2,1,:,90],color='green')
plot(z,R[2,1,:,40],color='black')
xlim(0,10)
ylim(0,30)
```

```
Out[11]: (0, 30)
```



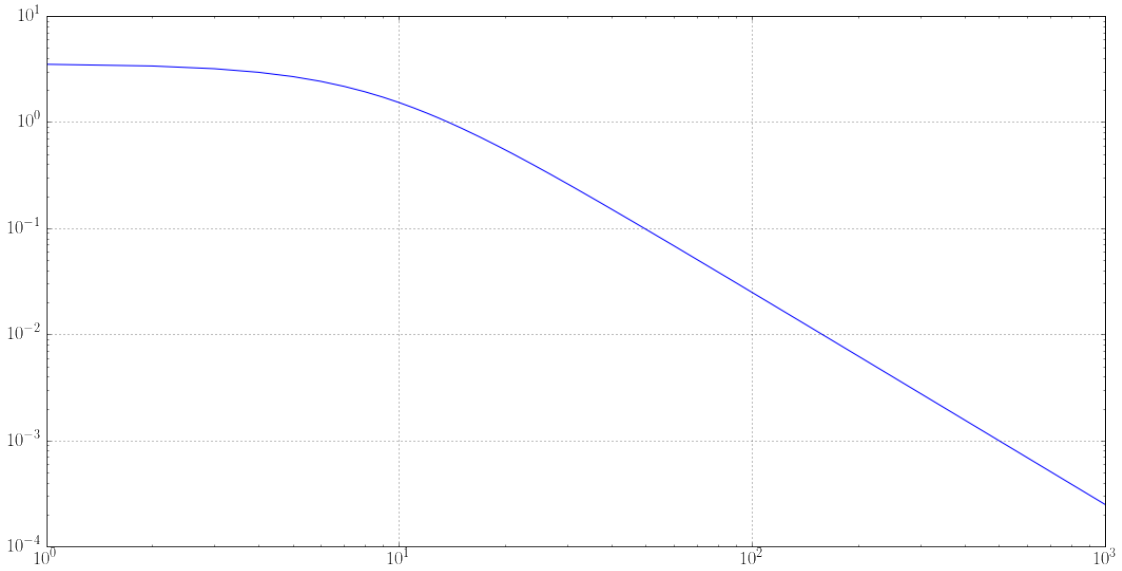

```
def calc(l):
    return norm(r-r_[l],axis=-1)
```

```
calc(10).shape
```

```
Out[13]: (3, 3, 1000)
```

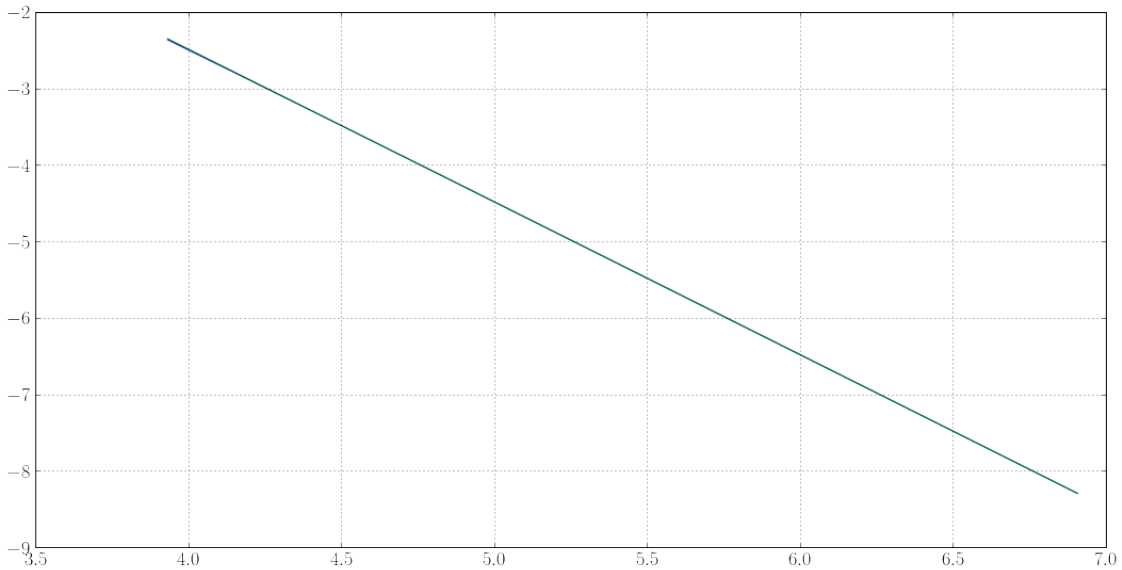
```
A_x = sum(cos(phi_)*exp(0.1j*R)*I[:,0]/R,axis=-1)
A_y = sum(cos(phi_)*exp(0.1j*R)*I[:,1]/R,axis=-1)
```

```
#Bz = (A[2,1,:,1]-A[1,2,:,0]+A[0,1,:,1]-A[1,0,:,0])/4
Bz = (A_y[1,2,:]-A_y[1,0,:]-(A_x[2,1,:]-A_x[0,1,:]))/4
loglog()
grid()
plot(z,abs(Bz))
show()
```




```
K=50
y = log(abs(Bz))[K:]
x = log(z[K:])
A = c_[x,ones(1000)[K:]]
m,b = lstsq(A,y)[0]
plot(x,y)
print(m,b)
plot(x,m*x+b)
grid()
show()
```

```
-1.99734473131 5.50433376575
```



```
import scipy.signal as sp
```