

```
import scipy.integrate as sc
import matplotlib.pyplot as plt
import numpy as np
```

```
#question 1
```

```
def f(theta,theta0,g,l):
    return 4*np.sqrt(1/(2*g))*1/np.sqrt(np.cos(theta)-np.cos(theta0))
```

```
#question 2
```

```
def periodRect(theta0,g,l,n):
    som=0
    for i in range(0,n):
        theta=i*theta0/n
        som=som+f(theta,theta0,g,l)*(theta0/n)
    return som
```

```
#question 3
```

```
def periodRectquad(theta0,g,l):
    return sc.quad(f,0,theta0,args=(theta0,g,l))[0]
```

```
#question 4
```

```
Ltheta0=list(np.linspace(0.001,np.pi-0.001,100))
Periode1=[]
Periode2=[]
g=9.98
l=1
n=100
for i in Ltheta0:
    x=periodRect(i,g,l,n)
    Periode1.append(x)
    y=periodRectquad(i,g,l)
    Periode2.append(y)
plt.plot(Ltheta0,Periode1)
plt.plot(Ltheta0,Periode2)
plt.show()
```