

Resources used:

Book (Galgar), Class Notes,
Desmos
Google Collab
Google Doc, Classroom
One Note
Pens, Laptop and a notebook

Code:

```
import matplotlib.pyplot as plt
R=[1,12,36,54] #in Mbps
N=[10,50,100]
ptx=[0.3141,0.5303,0.63397]
ps=[0.839,0.674,0.583]
# in bits
p=8184
h=400
ack=240
# in microsec
st=50
pd=1
sifs=28
difs=128
leg=[]
for rate in R:
    Ts= (((h+p+ack)/rate)*(2**-6)) + ((sifs+difs+pd+pd)* (1e-6))
    Tc= (((h+p)/rate)*(2**-6)) +((difs+pd)* (1e-6))
    # print(Ts,Tc)
    x=[]
    for i in range(len(N)):
        s=(p*(2**-6))/(Ts-Tc+(((st*((1e-6))*(1-ptx[i]))/ptx[i])+Tc)/ps[i]))
        x.append(s)
    plt.plot(N,x)
    leg.append('Rate='+str(rate)+'Mbps')
plt.legend(leg)
plt.show()
```

```

import matplotlib.pyplot as plt
R=[54] #in Mbps
N=[10,50,100]
ptx=[0.3141,0.5303,0.63397]
ps=[0.839,0.674,0.583]
# in bits
p=8184
h=400
ack=240
# in microsec
sta=[50, 25, 5, 0.8]
pd=1
sifs=28
difs=128
leg=[]
rate=R[0]
for st in sta:
    Ts= (((h+p+ack)/rate)*(2**-6)) + ((sifs+difs+pd+pd)* (1e-6))
    Tc= (((h+p)/rate)*(2**-6)) +((difs+pd)* (1e-6))
    # print(Ts,Tc)
    x=[]
    for i in range(len(N)):
        s=(p*(2**-6))/((Ts-Tc+(((st*((1e-6))*(1-ptx[i]))/ptx[i])+Tc)/ps[i]))
        x.append(s)
        print(s,end=',')
    print()
    plt.plot(N,x)
    leg.append('Slot time='+str(st)+'microsec')
plt.legend(leg)
plt.show()

```