Problem 3

$$\frac{\pi}{4} = \frac{"number\ of\ points\ inside\ the\ circle"}{total\ number\ of points\ inside\ the\ circle}$$

$$\pi = 4 \times \frac{"number\ of\ points\ inside\ the\ circle"}{total\ number\ of points\ inside\ the\ circle}$$

Therefore, we have to find the number of points inside the circle and the total number of points inside the circle.

a)

By using for loop, we calculate the number of points inside the circle and total number of points inside the circle.

Then we can calculate the approximated value of pi, absolute error, and relative error.

b)

Since we have to make 3 plots, we use subplot.

By using for loop, we calculate the time of execution of my code for various values of n and plot the resulting execution times. against n. We used function MontePi(n) for this.

By using for loop, we compute the approximation of pi for various values of n and plot the resulting absolute errors against n. We also used MontePi(n) for this.

We do not use this function in last plot. In order to find points inside the circle and points outside the circle, I did not that function, but I used the principal of this function.