EE110B LAB 1

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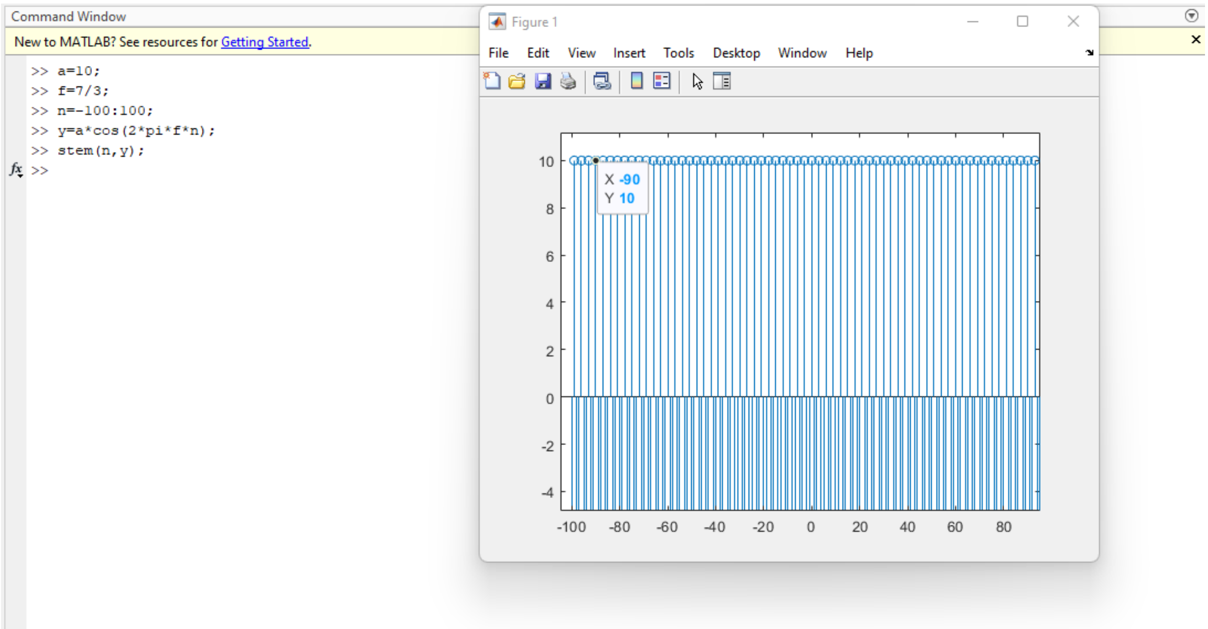
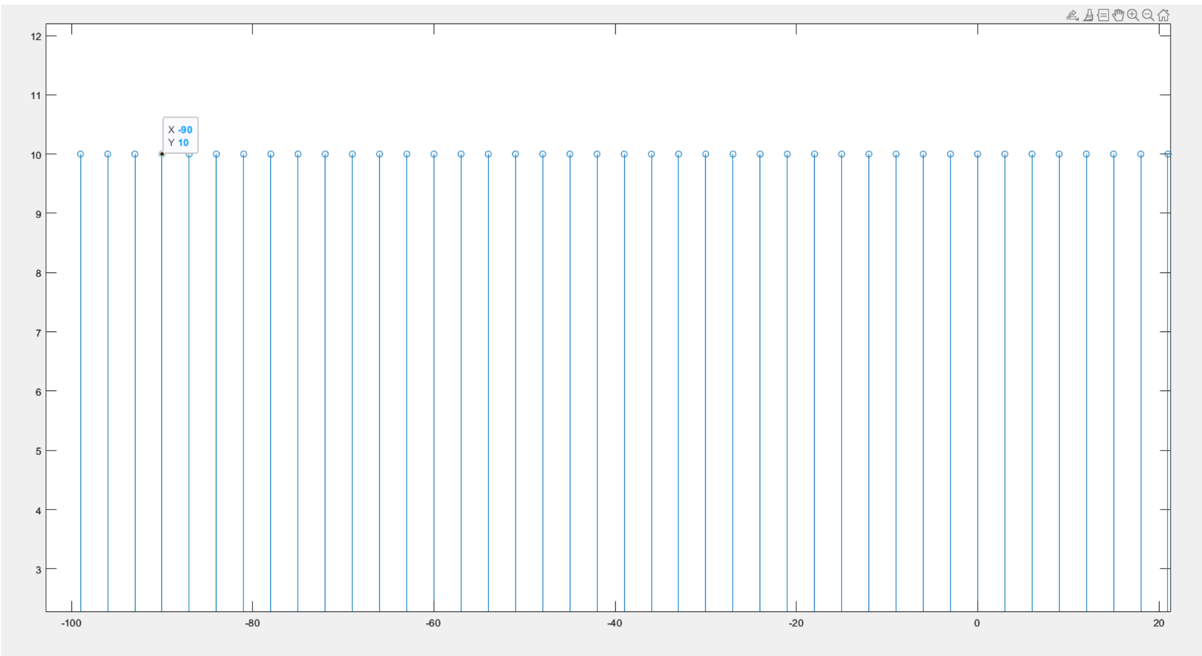
1) The range for all n is from -100 to 100

a)

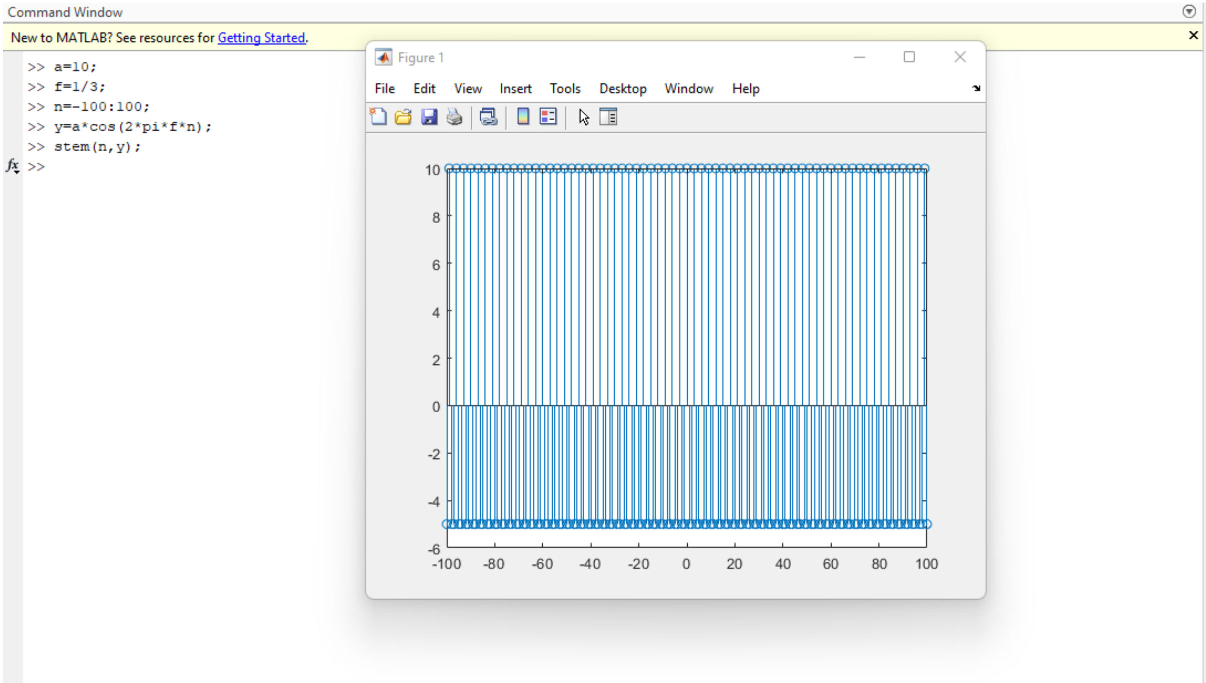
cos(2pi7/3n)

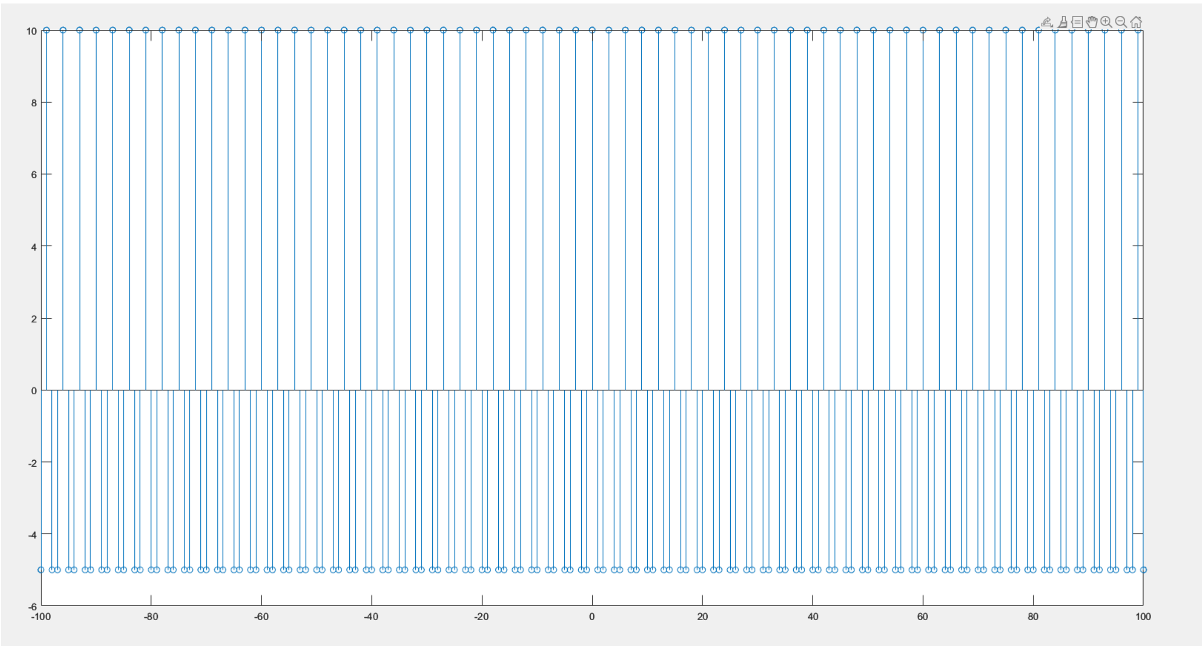




The period for this sequence is 3.

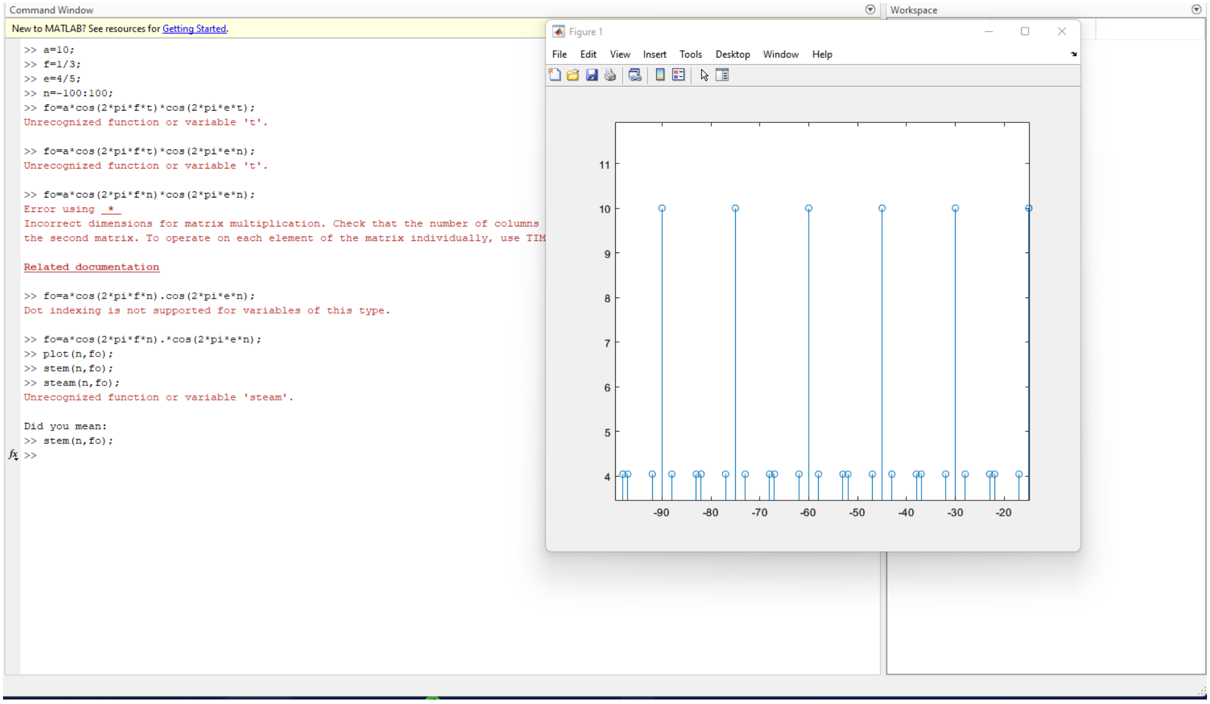
cos(2pi1/3n)





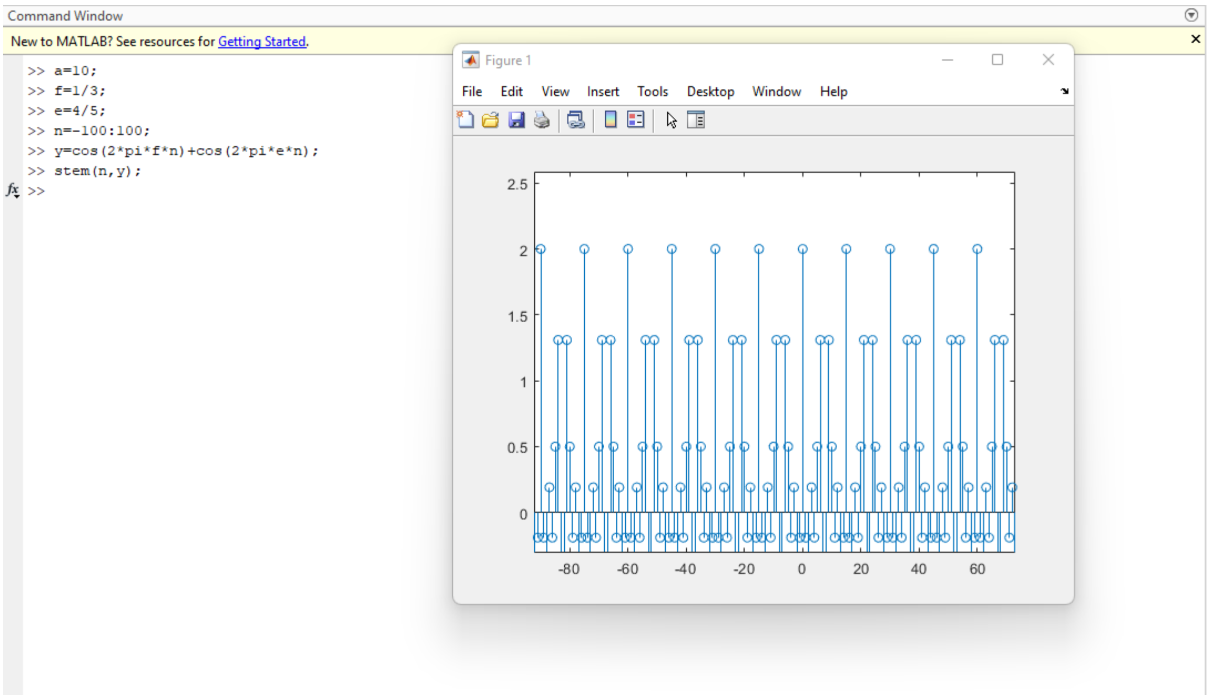
The period is 3

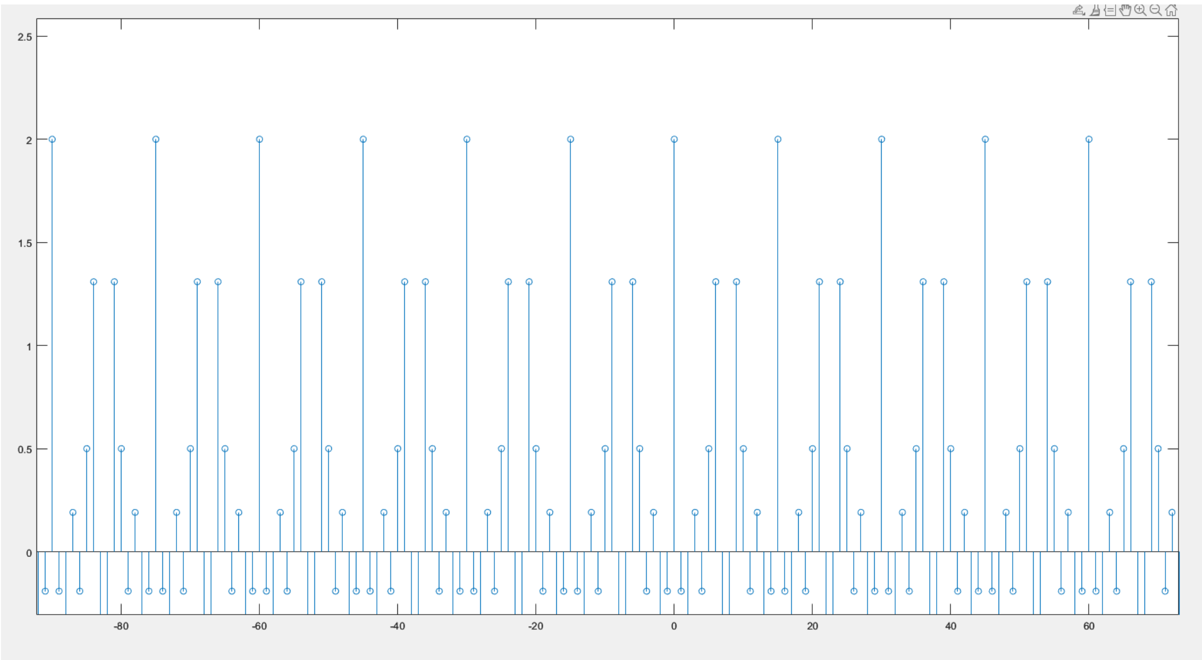
b)**cos(2pi1/3n)cos(2pi*4/5n)**



Yes, the period is 3x5, which is 15

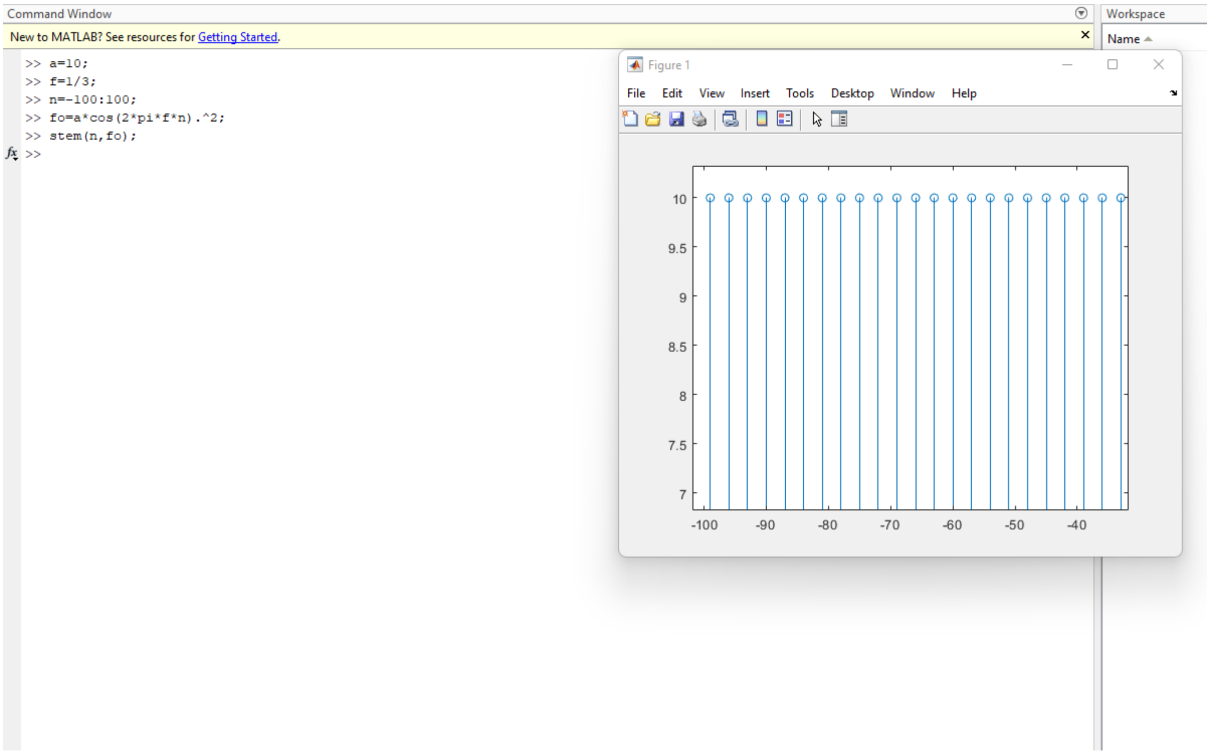
c) **cos(2pi1/3n)+cos(2pi*4/5n)**





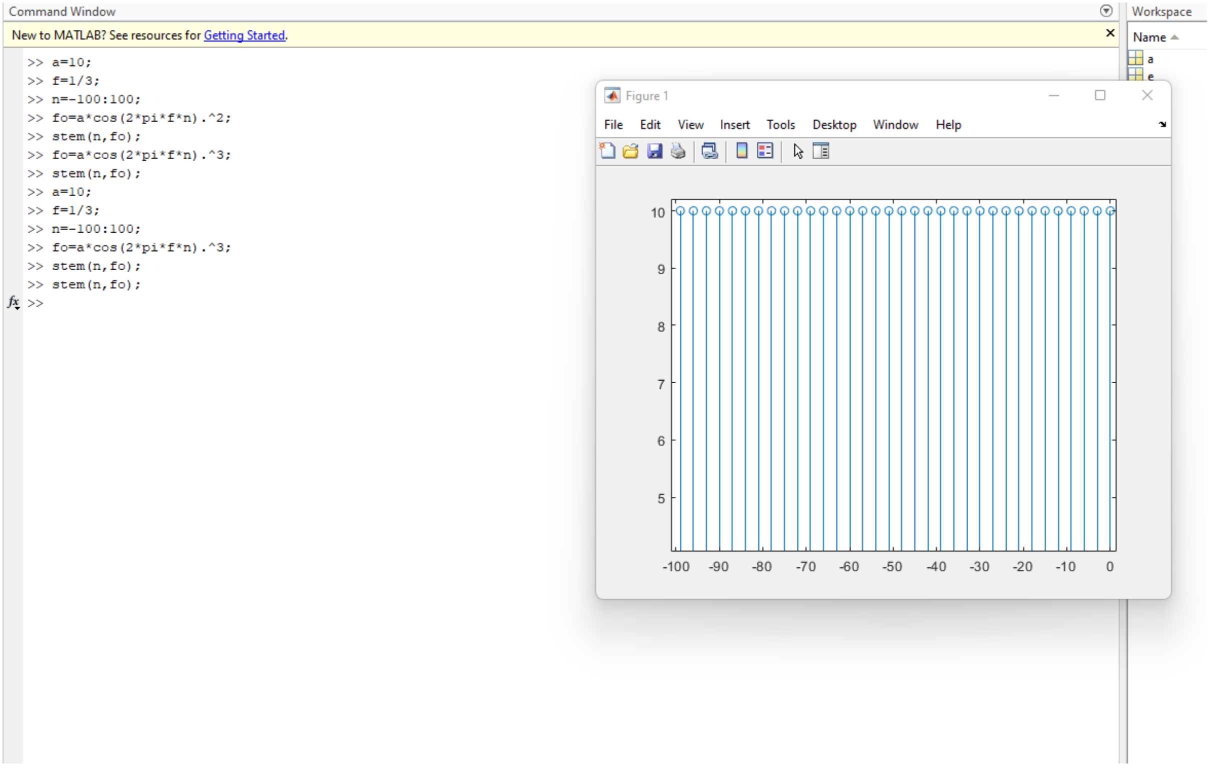
Yes, the period is 3x5, which is 15

d) **cos^(2)(2pi1/3n)**



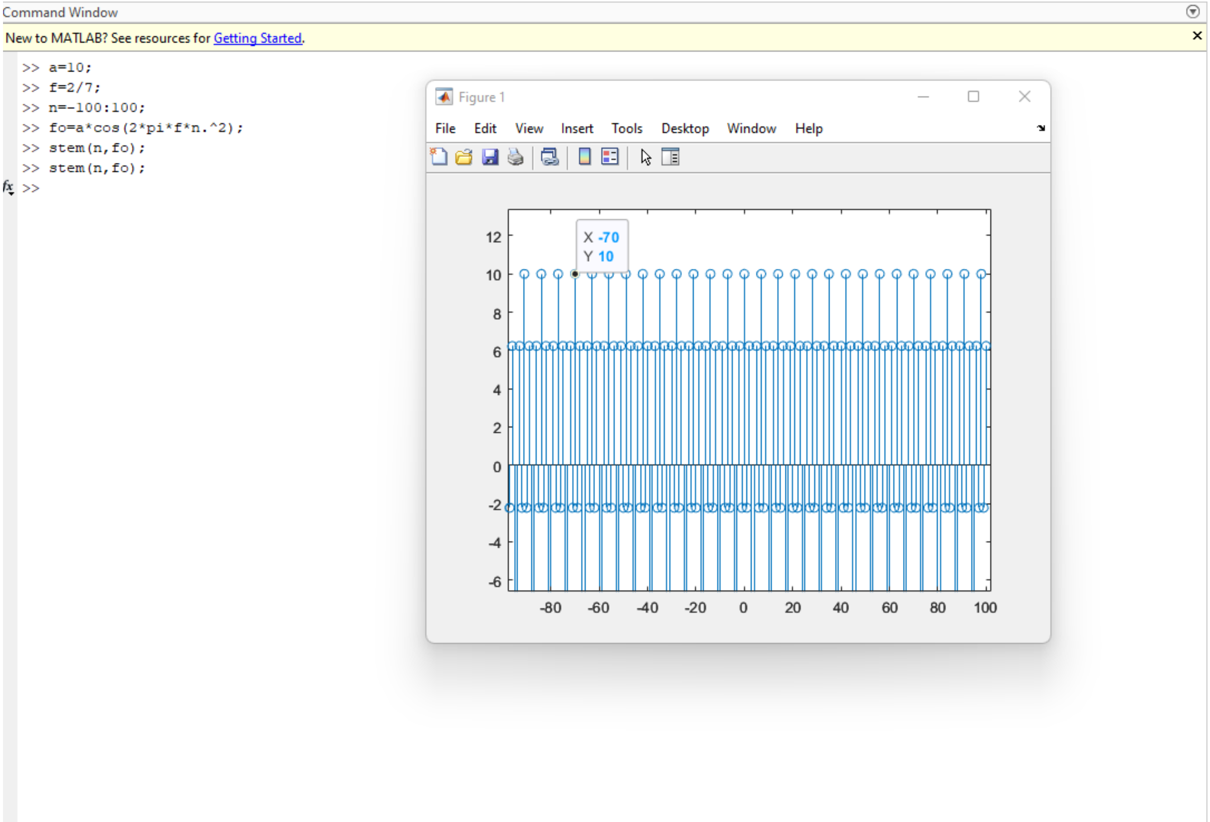
The period is 3

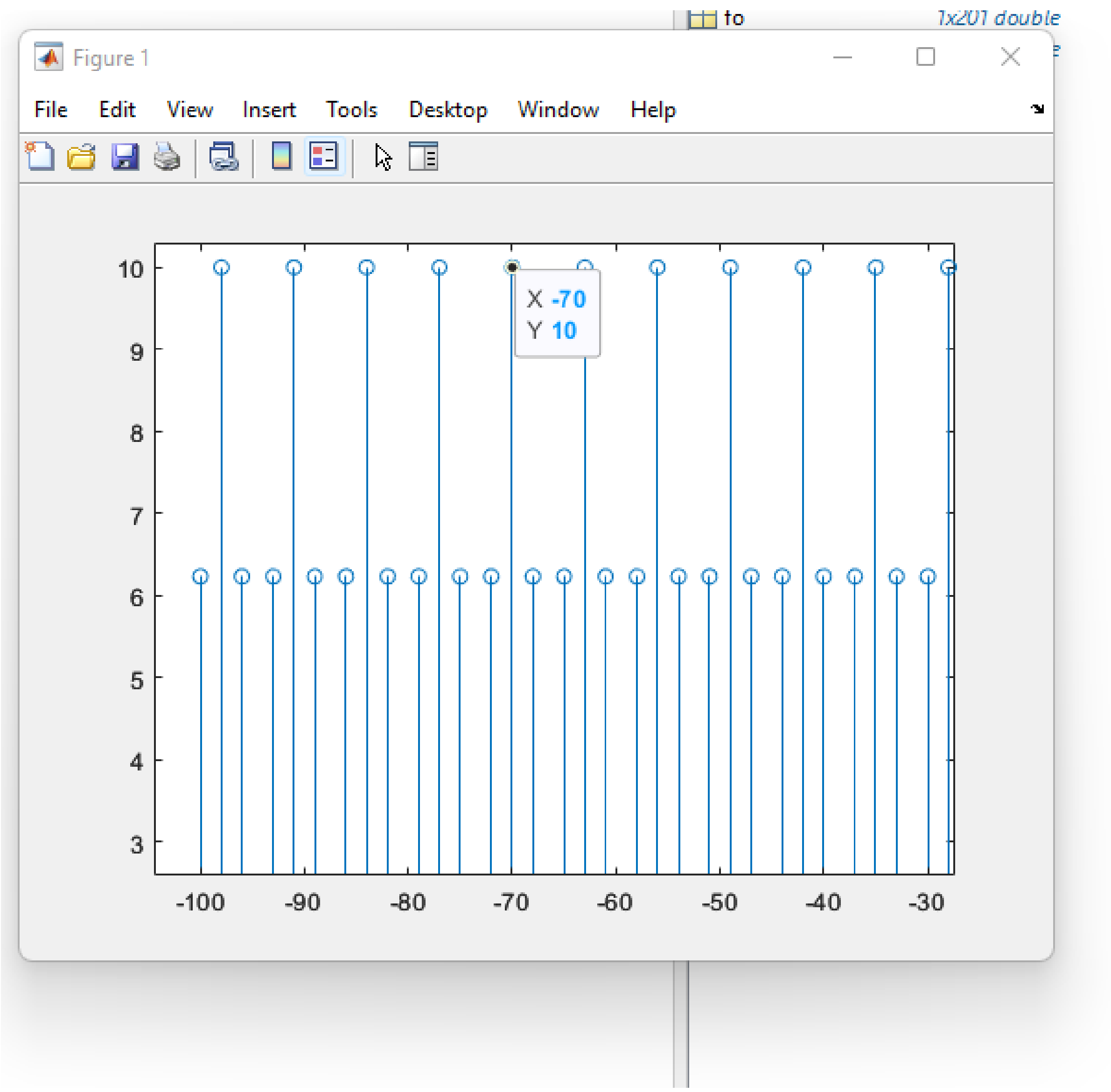
e) **cos^(3)(2pi1/3n)**



The period is 3

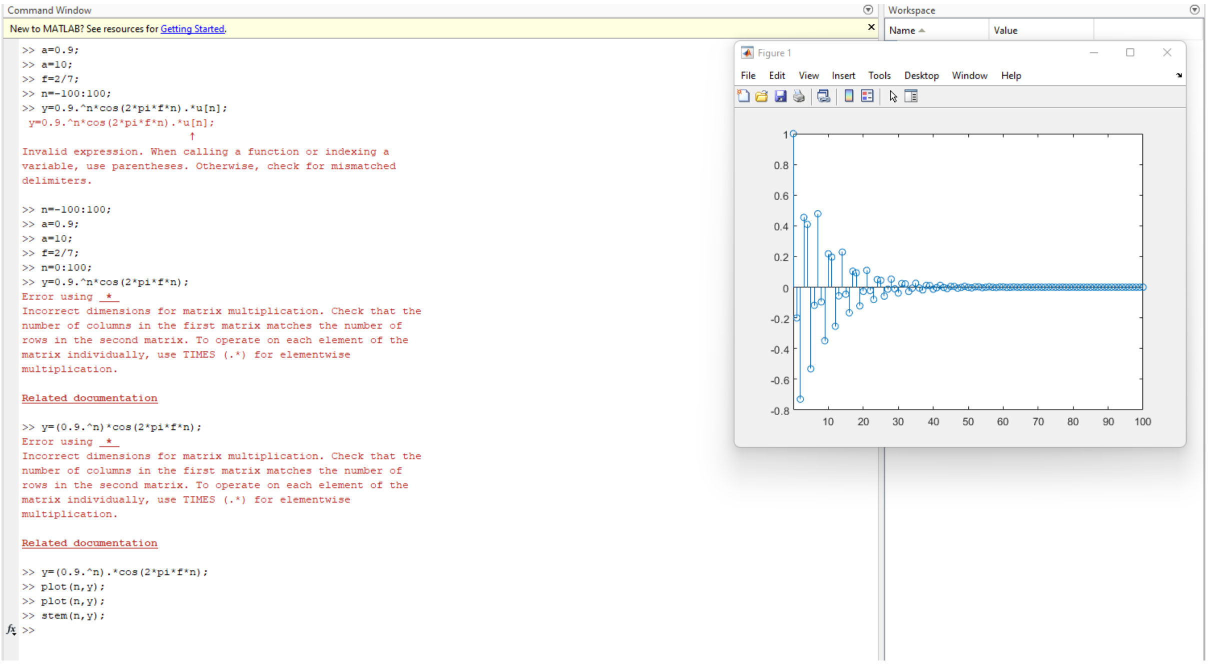
f) **cos(2pi2/7n^(2))**

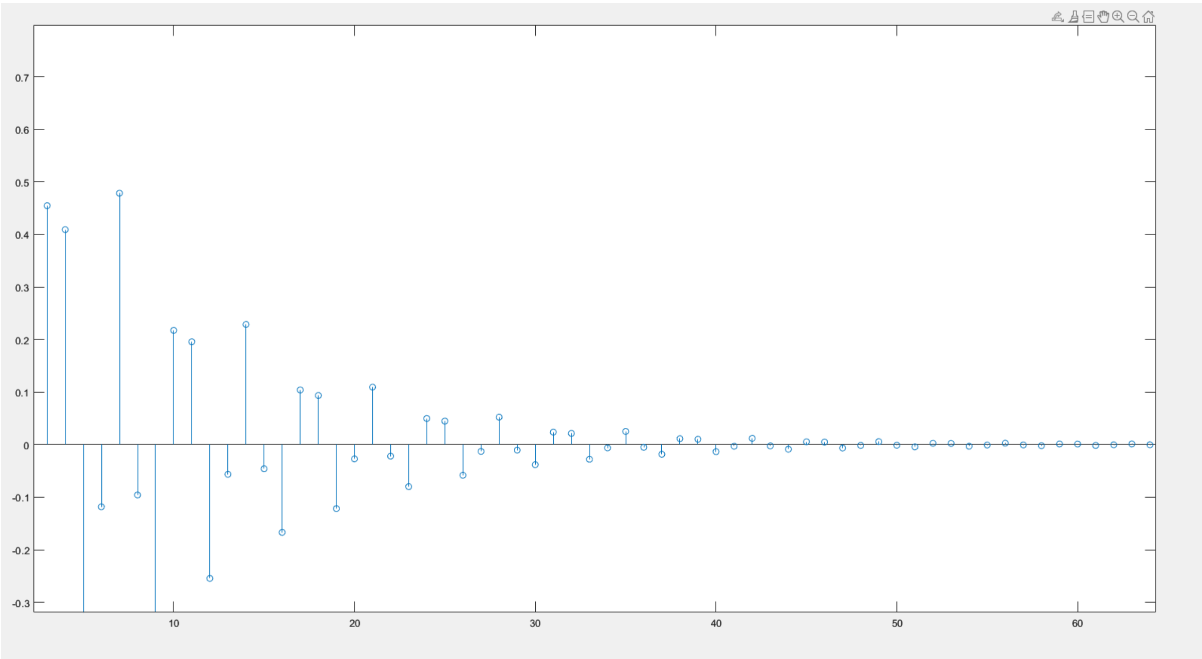

Command Window
New to MATLAB? See resources for Getting Started.
>> a=10;
>> f=2/7;
>> n=-100:100;
>> fo=a*cos(2*pi*f*n.^2);
>> stem(n,fo);
>> stem(n,fo);
>>
Figure 1
File Edit View Insert Tools Desktop Window Help
X -70
Y 10
12
10
8
6
4
2
0
-2
-4
-6
-80 -60 -40 -20 0 20 40 60 80 100



+Yes, the frequency stays the same because the series has repeated the same pattern for the frequency.
+Yes, the period is staying at a constant 7 because we can divide to even.
What happens when n=1, the period is 7
Also, what happens when n =8, the period is also 7
After some calculations, the period is also staying at 7
-> the period is 7

g) **0.9^(n)cos(2pi2/7n)u[n]**





It will become 0 the n goes to infinity because the coefficient is less than 1 (0.9 <1) so it decays to 0

h) **1.1^(n)cos(2pi2/7n)u[n]**

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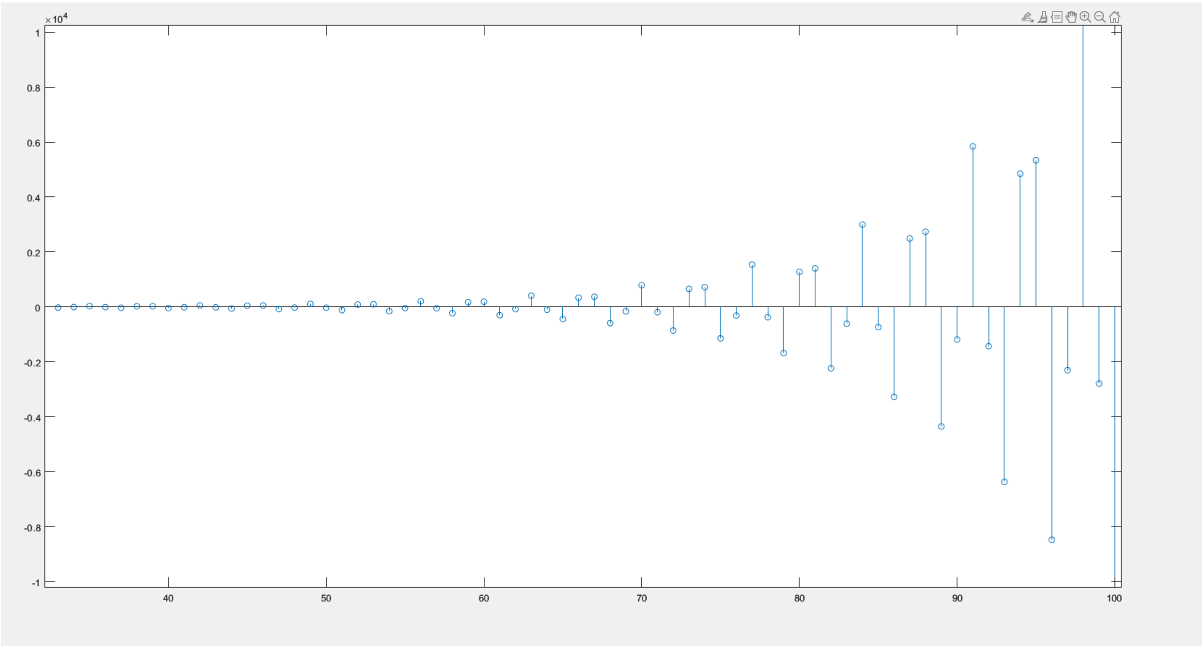
elated documentation

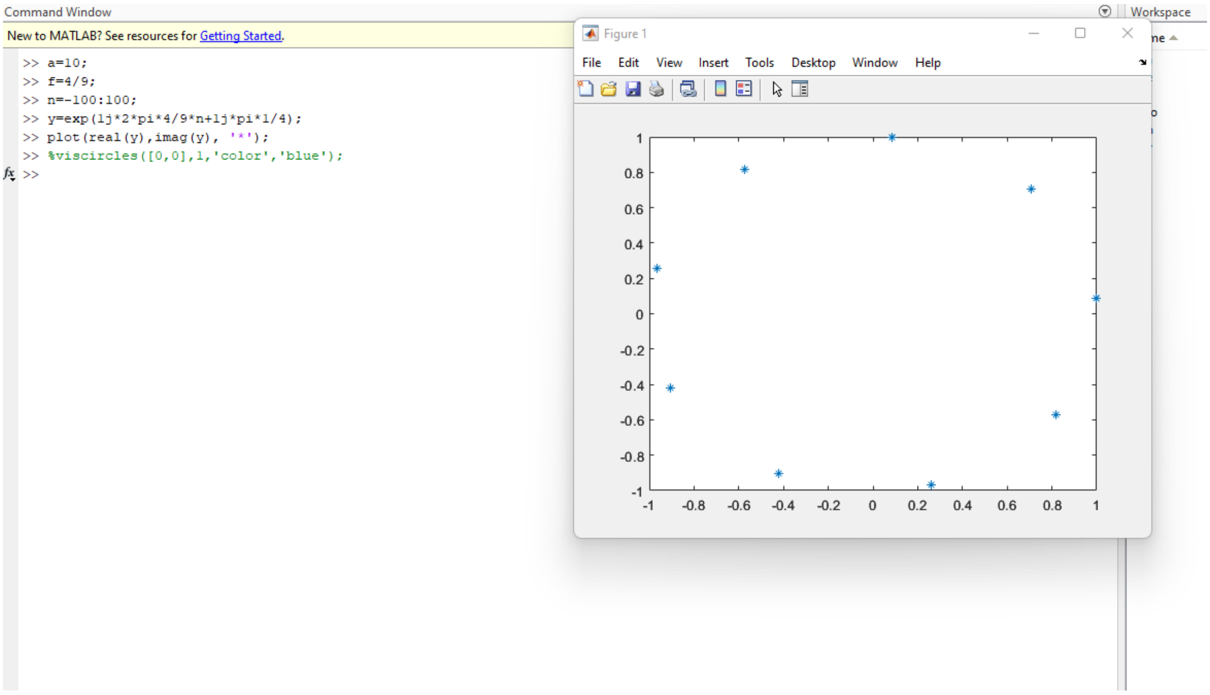
> y=(0.9.^n).*cos(2*pi*f*n);
> plot(n,y);
> plot(n,y);
> stem(n,y);
> y=(1.1.^n).*cos(2*pi*f*n);
> stem(n,y);
>
```



It will become infinity as n goes to infinity because the coefficient of the function is 1.1, which is greater than 1 (1.1>1). That's a reason why x[n] increases to infinity as n increases to infinity.

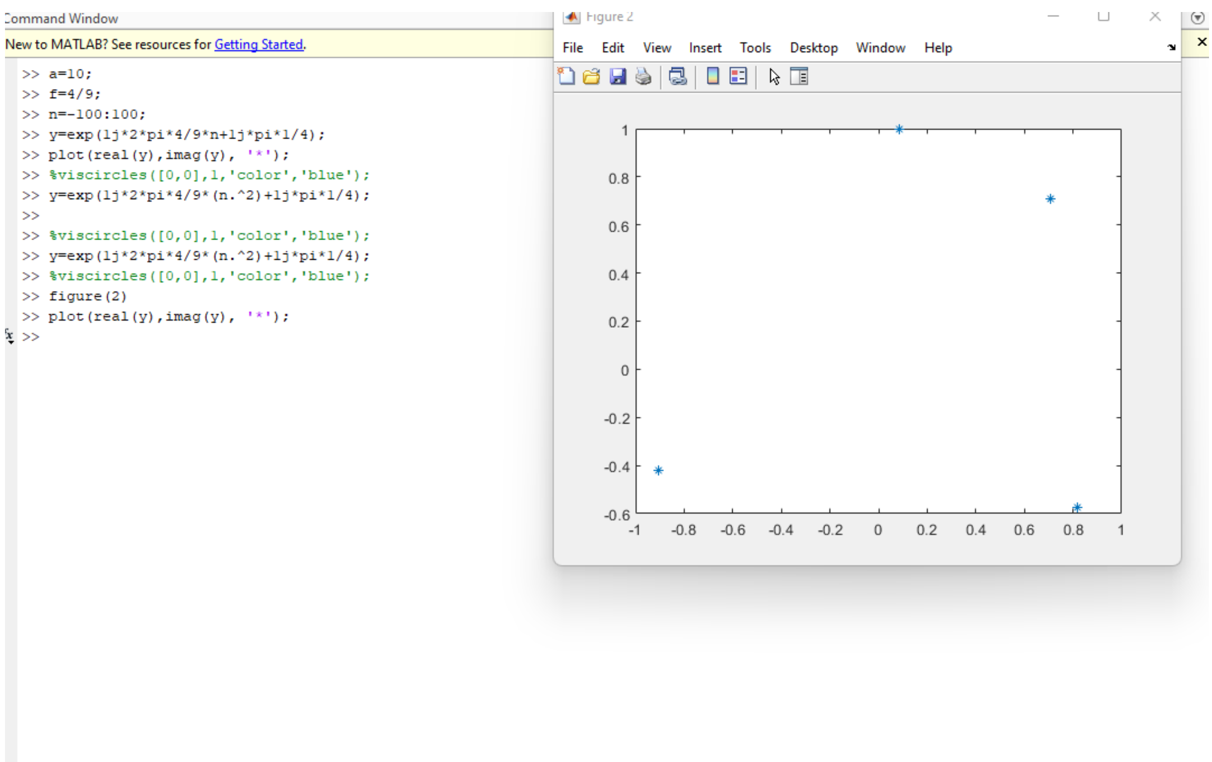
2)

a) e^(j2pi4/9n+jpi/4)



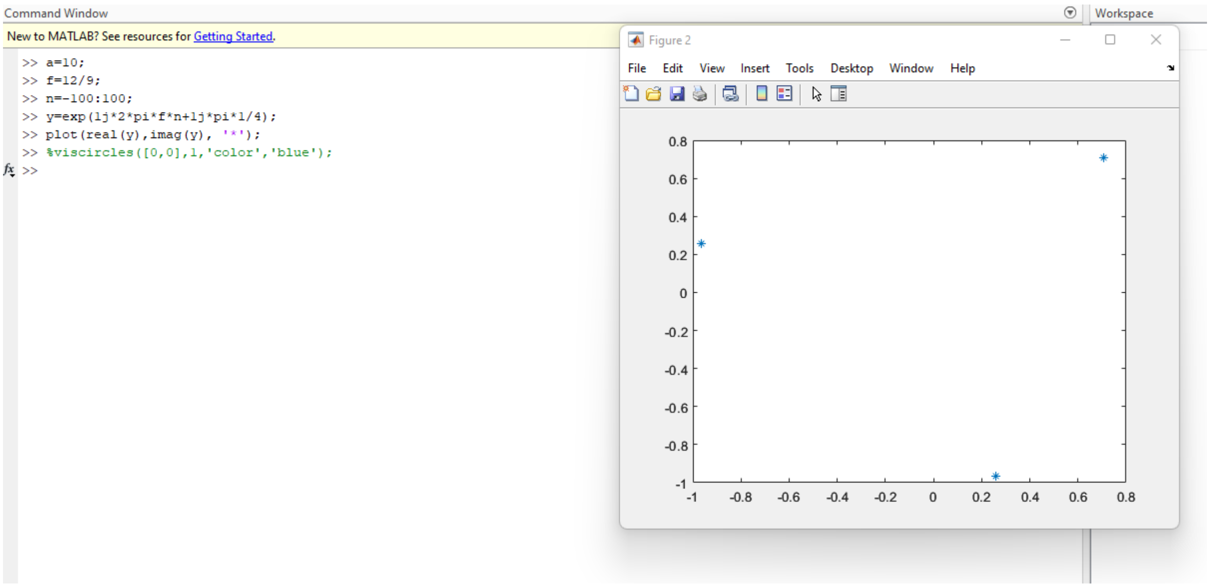
There are 9 distinct points on the unit circle because the period of this function is 9 -> 9 distinct points

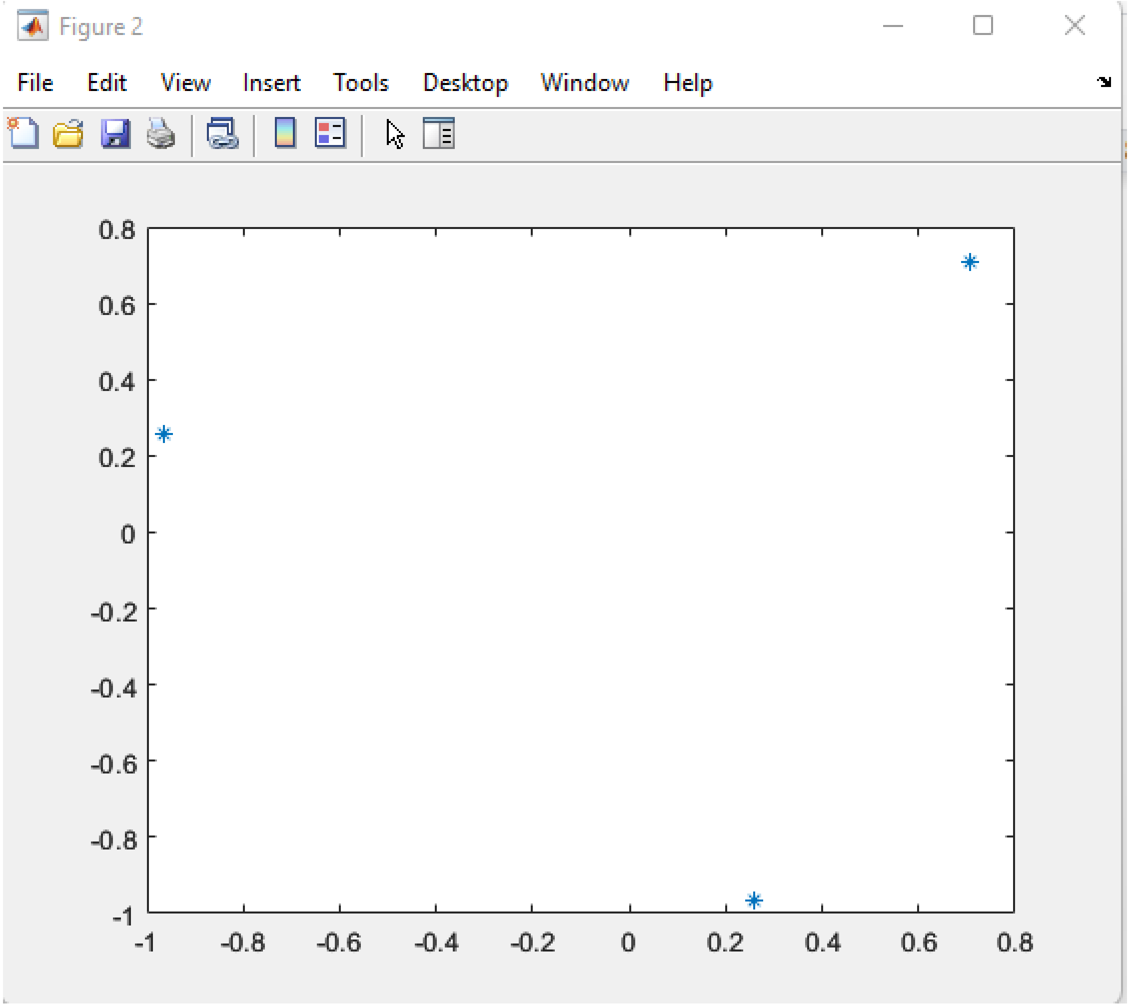
b) e^(j2pi4/9n^(2)+jpi/4)



There are 4 distinct points on the unit circle because as the observation, the period of this is 4 . There are repeating values due to the n^2 , as well as the distinct points are also included in this case.

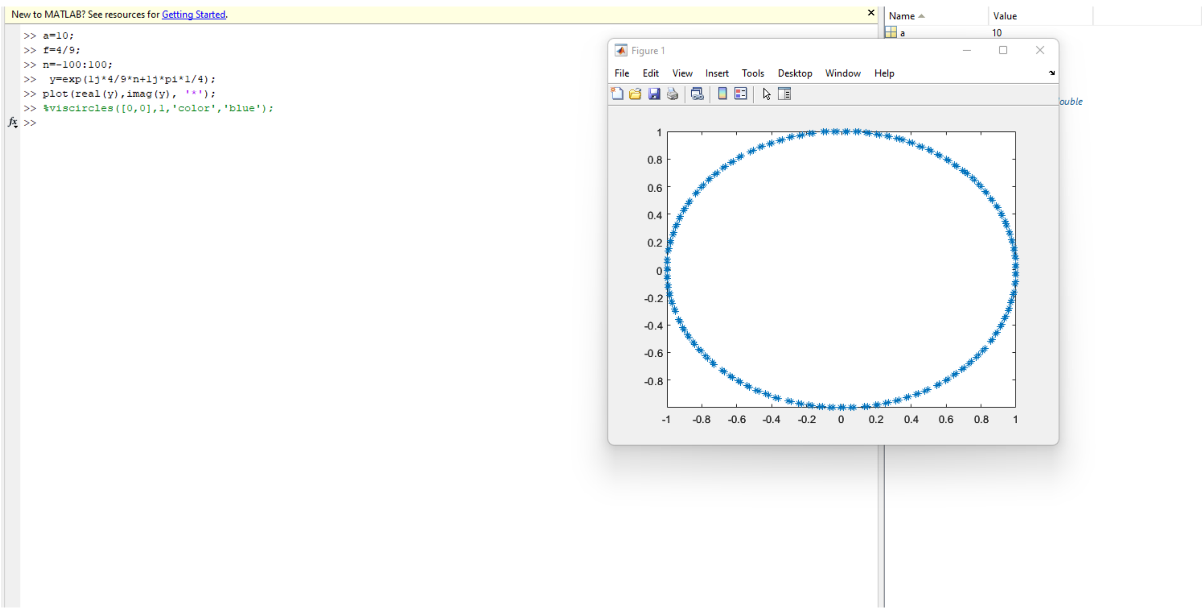
c) e^(j2pi12/9n^(2)+jpi/4)

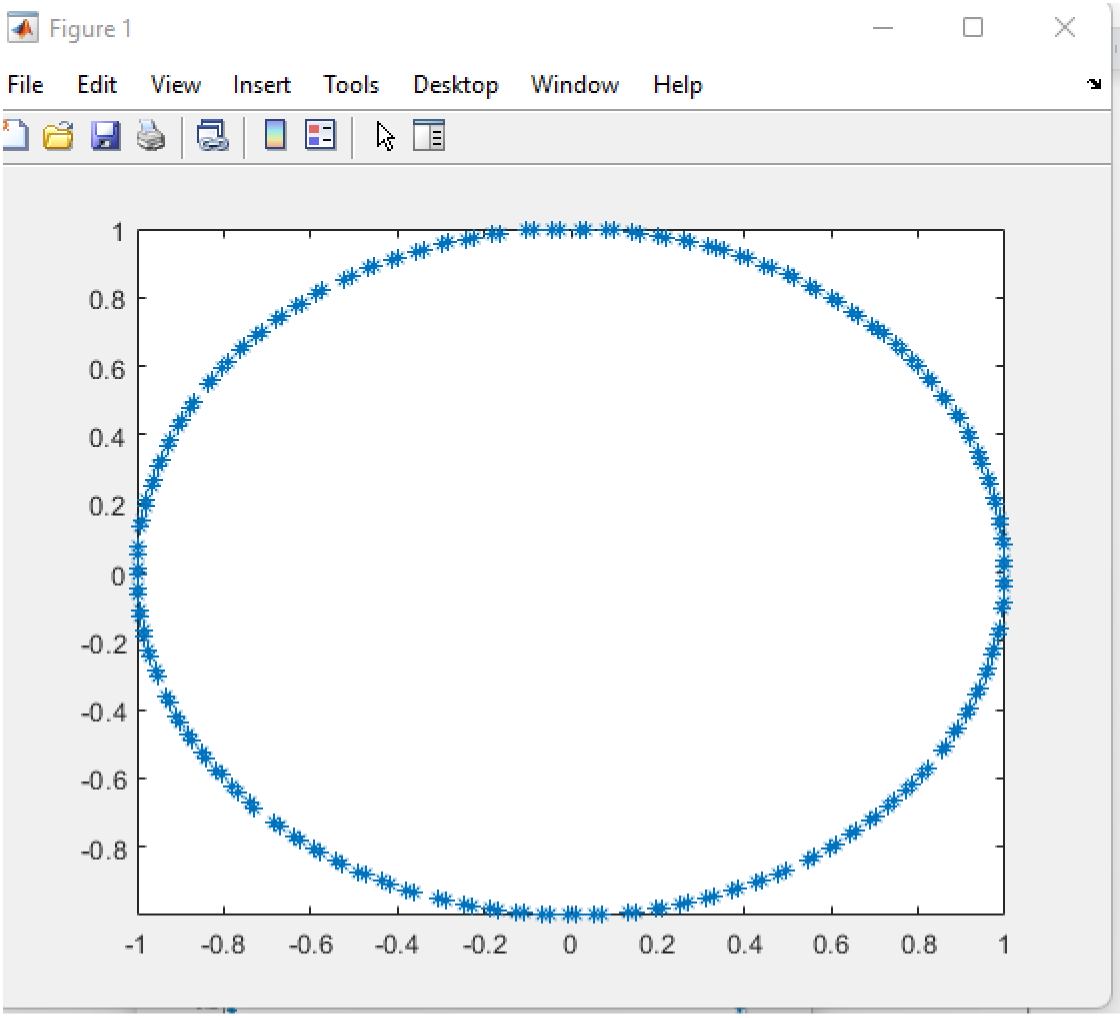




When reducing the 12/9, it becomes 4/3-> the period is 3
From that, there are 3 distinct points because the period is 3.

d) e^(j4/9n^(2)+pi/4)





Due to the period being infinity, the more increasing in the period from 0 to infinity, the more distinct points as we get to infinity distinct points on the unit circle.