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Non-Imaginary unit Circle and Distribution Odd Natural Numbers

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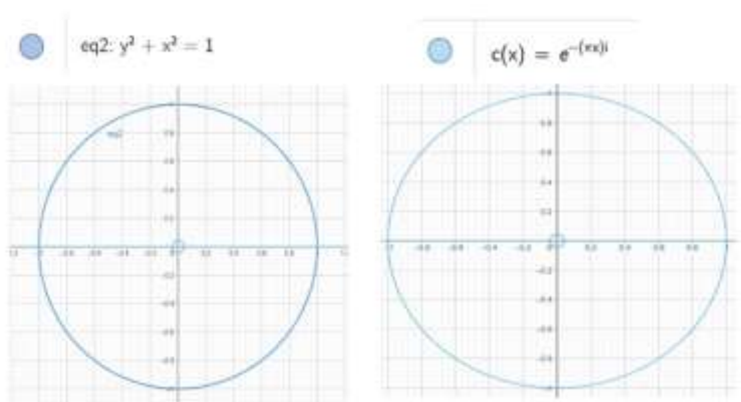
Abstract

This paper introduces a non-Imaginary unit circle partitioning as proof for the distribution of odd natural numbers in relation to an imaginary unit circle in a complex plane. First, we will introduce the concept of a non-imaginary unit circle and its relation to an imaginary unit circle in a complex plane. Then we will go through some examples to prove that for any N odd natural number at N/2, we only have the imaginary part for any complex number on the complex plane if we use our technique of portioning for the non-imaginary unit circle.

Keywords: zeta function, Riemann hypothesis, complex plane, none-trivial zeros, critical strip

1. Introduction

1 - Unit circle is equivalent to imaginary unit circle



2- an imaginary unit circle $e^{-(\pi * X) * i}$ in a complex plane have some properties

$$C(x) = \begin{cases} 1\,; & for\ X\ even\ natural\ Number \\ -1\,; & for\ X\ odd\ natural\ Number \end{cases}$$

$$C(x) = \begin{cases} i\,; & at\ e^{-\frac{3*\pi\, i}{2}} \\ -i\,; & at\ e^{-\frac{\pi\, i}{2}} \end{cases}$$

$$C(x) = \begin{cases} i\,; & at\ X = \frac{3}{2}\ or\ X = (1.5 * X) \\ -i\,; & at\ X = \frac{1}{2}\ or\ X = (0.5 * X) \end{cases}$$

3- In non-Imaginary unit circle $x^2 + y^2 = 1$ in a complex plane have some properties

$$C(x) = \begin{cases} 1\,; & for\ X\ even\ natural\ Number \\ -1\,; & for\ X\ odd\ natural\ Number \end{cases}$$

$$C(x) = \begin{cases} i\,; & at\ X = \dfrac{3}{2}\ or\ X = (1.5 * X) \\ -i\,; & at\ X = \dfrac{1}{2}\ or\ X = \ (0.5 *\ X) \end{cases}$$

This non-imaginary unit circle world is a normal circle and do not have any exponential value e. In normal imaginary unit circle, we get value equal to imaginary unit [±i] at $e^{-\frac{3*\pi i}{2}}$ or at $e^{-\frac{\pi i}{2}}$.

we are going to use the same division concept (X = X/2) in our normal circle world to be able to represent the imaginary unit [±i]. Division will be at 45 degrees. And this degree in imaginary unit circle world will be at $e^{-\frac{\pi i}{4}} = e^{-\frac{0.5\,\pi i}{2}}$

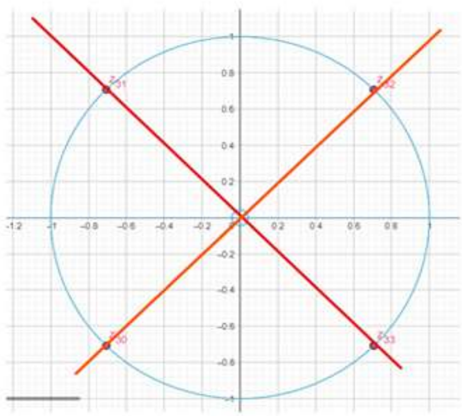


Figure (1). non-imaginary unit circle initial division X = X/2

Inorder to sync both worlds together (non-imaginary unit circle and imagirnary unit circle),

We are going to use small trick to define a division function for the non-imaginary unit circle world to represent this division in term of imaginary unit circle using this formula

$f(T,D) = \ e^{-\frac{T*\pi * i}{D}}$

$;where\ N = Number\ of\ Division\ and\ T\ is\ the\ movement\ step\ on\ Circle\ Circumference.$

For Example: if D = 2 and T = 1/2

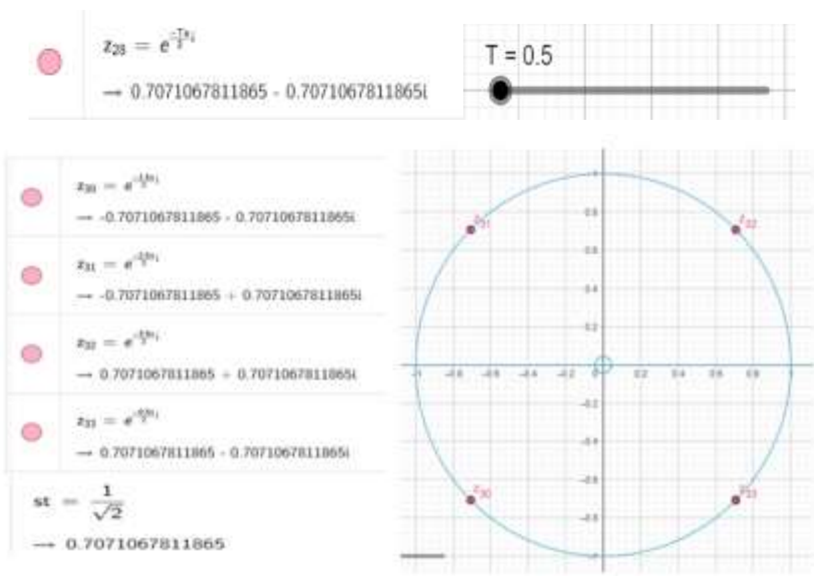


Figure (2). Imaginary unit circle initial division X = X/2

2. Non-Imaginary Circle Partitioning Formula

To divide something to equal parts you need to know the length of it. You need one start point to start your partitions at and an end point to mark the end of your partition for one full rotation on the non-imaginary unit circle.

We are going to introduce a new formula to find this start point for partitioning for any natural number.

$$f(D,N)=\begin{cases}\dfrac{D*(2*E-E+1)-1}{D} & ;where\ E=2*N\ is\ and\ even\ number\\ \dfrac{D*(3*N-N+1)-1}{D} & ;\ and\ N\ is\ any\ natural\ number\end{cases}$$

$$where\ D\ is\ how\ many\ partitions\ we\ are\ going\ to\ apply$$

We can convert this formula.

$$f(D\ ,N)=\begin{cases}\dfrac{D*\ (2*2*N-2*N+1)-1}{D} & ;for\ any\ N\ even\ number\\ \dfrac{D*2*\ (3*N/2-N/2+1/2)-1}{D} & ;for\ any\ N\ natural\ number\end{cases}$$

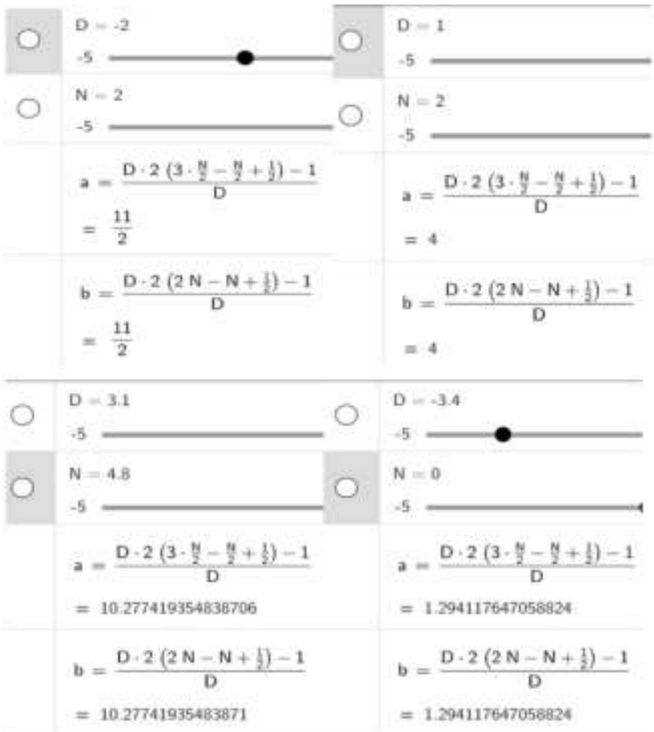
$$f(D\ ,N)=\begin{cases}\dfrac{D*\ (2*2*N-2*N+1)-1}{D} & ;for\ any\ N\ even\ number\\ \dfrac{D*(3*N-N+1)-1}{D} & ;for\ any\ N\ natural\ number\end{cases}$$

Another note here both formulas are equivalate to each other 2 * (3 *N/2 -N/2 +1/2)

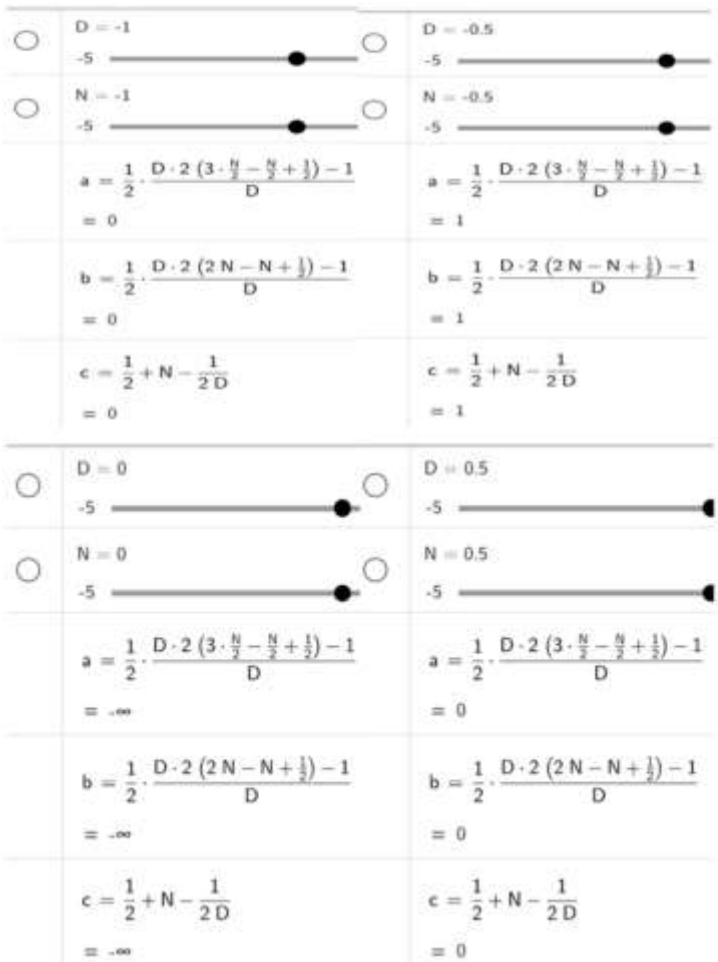
Equivalent to 2 * (2 *N - N +1/2) and both equal to 2 *(N+1/2) -1/D

$$2*\left(N+\frac{1}{2}\right)-\frac{1}{D}=\frac{D*\ 2*\left(2*N-N+\frac{1}{2}\right)-1}{D}=\frac{D*\ 2*\left(3*\frac{N}{2}-\frac{N}{2}+\frac{1}{2}\right)-1}{D}\ \rightarrow(A)$$

$$\frac{1}{2}+N-\frac{1}{2*D}=\frac{D*\ \left(2*N-N+\frac{1}{2}\right)-\frac{1}{2}}{D}=\frac{D*\ \left(3*\frac{N}{2}-\frac{N}{2}+\frac{1}{2}\right)-\frac{1}{2}}{D}\ \rightarrow(B)$$

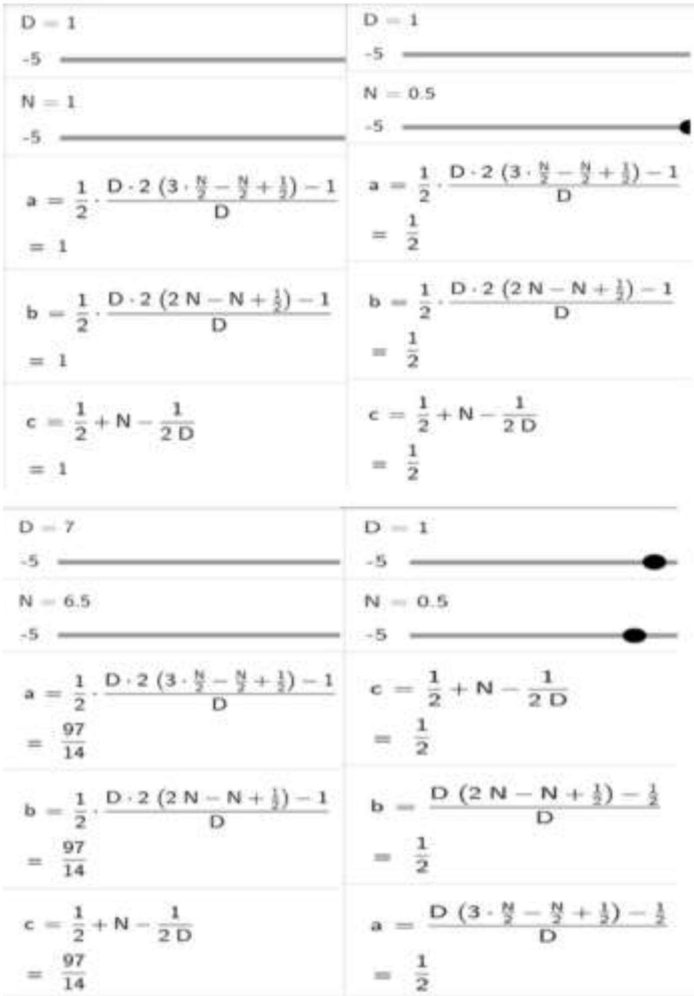


And if we multiply all three formulas by 0.5 so all three will be equal to (1/2 + N -1/2D)



$$2*\left(N+\frac{1}{2}\right)-\frac{1}{D}=\frac{D*\ 2*\left(\ 2*N-N+\frac{1}{2}\right)-1}{D}=\frac{D*\ 2*\left(\ 3*\frac{N}{2}-\frac{N}{2}+\frac{1}{2}\right)-1}{D}\ \rightarrow(A)$$

$$\frac{1}{2}+N-\frac{1}{2*D}=\frac{D*\left(\ 2*N-N+\frac{1}{2}\right)-\frac{1}{2}}{D}=\frac{D*\left(\ 3*\frac{N}{2}-\frac{N}{2}+\frac{1}{2}\right)-\frac{1}{2}}{D}\rightarrow(B)$$



3. Using the Partitioning Formula on non-Imaginary Unit Circle

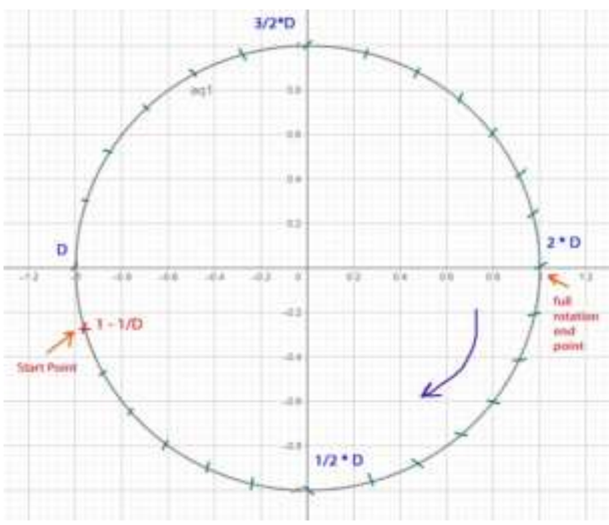


Figure (3) partitioning the non-Imaginary unit circle $x^2 + y^2 = 1$ using our formula; for any number of partitions D.

A) In Imaginary unit circle world $f(T, D) = e^{-\frac{T*\pi*i}{D}}$

This Same complex number when T =1, will be the Start point on non-Imaginary unit circle world, and will be at $\frac{T}{D}$ = [$\frac{D-1}{D}$] at T = [D-1] And (pass over) step at T= 2 * D.

B) In non-Imaginary unit circle world, we are going to use the formulas but with the same values for Start point will be at $\frac{T}{D}$ = [$\frac{D-1}{D}$] at T = [D-1] And (pass over) step at T= 2 * D.

C) If D is even number, the intersection on imaginary axes will be on whole number and if D is an odd number the intersection with imaginary axes will be N+1/2 or M-1/2

For Odd Divisions D = odd number

complex number with imaginary part [-i]; $at\ D = 5;\ e^{-\frac{2.5*\pi*i}{5}}$ all the time will be at D/2

complex number with imaginary part [i]; at D = 5; $e^{-\frac{7.5*\pi*i}{5}}$ will be at [3*D/2]

complex number with real part = [1]; at D = 5; $e^{-\frac{10*\pi*i}{5}}$ all the time will be D * 2^N

complex number with real part = [-1]; at $D = 5;\ e^{-\frac{5*\pi*i}{5}}$ all the time will be D * (2^N+1)

Next, we are going to show some examples on the non-imaginary unit circle domain.

Example (1): In non-Imaginary unit circle world At D = 2 and T = D-1 =1

Partitioning the non-Imaginary unit circle by 2 * D = 4, Which means once we reach partition number 4, we are going to go back to the exact complex number gain after one full circle on the non-imaginary circle world. Which also means when we are applying our partition formulas, we get complex numbers which moves on the non-Imaginary unit circle world with difference in between with step = 4

So, for T = (1,5,9,13, 17 …} Then T meats our partition= T/D at {1/2 ,5/2, 9/2, 13/2, 17/2, ….}

Where start point in this example is g1 =T/D= 0.5. where T = D -1 at start point.

One note here the 2* N values of the formula to find start point will be {+2, +4, +6, +8, +10, +12, ….}

And for multi full cycles we pass over the starting point at each {(1/2), (1/2) +2, (1/2) +4, (1/2) +6, (1/2) +8….} where (1/2) is the start point.

$$g_1 = \frac{2(2\cdot 1 - 1) - 1}{2} \rightarrow \frac{1}{2} \qquad g_1 = \frac{2(2\cdot 1 - 1) - 1}{2} \approx 0.5$$

$$h_1 = \frac{2(2\cdot 2 - 2 + 1) - 1}{2} \rightarrow \frac{5}{2} \qquad h_1 = \frac{2(2\cdot 2 - 2 + 1) - 1}{2} \approx 2.5$$

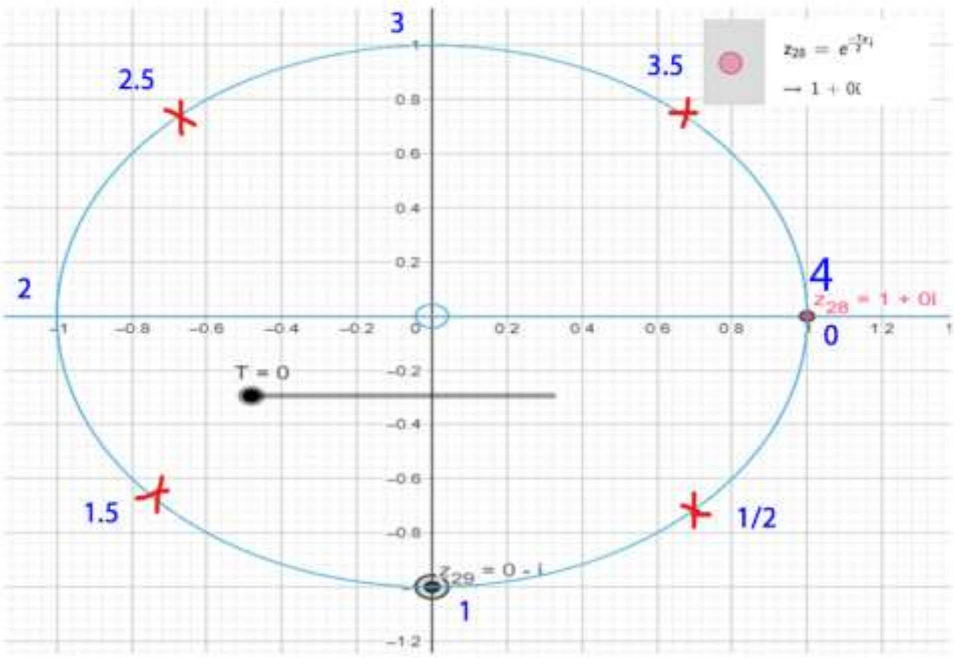
$$i_1 = \frac{2(2\cdot 4 - 4 + 1) - 1}{2} \rightarrow \frac{9}{2} \qquad i_1 = \frac{2(2\cdot 4 - 4 + 1) - 1}{2} \approx 4.5$$

$$f_1 = \frac{2(2\cdot 6 - 6 + 1) - 1}{2} \rightarrow \frac{13}{2} \qquad f_1 = \frac{2(2\cdot 6 - 6 + 1) - 1}{2} \approx 6.5$$

$$j_1 = \frac{2(2\cdot 8 - 8 + 1) - 1}{2} \rightarrow \frac{17}{2} \qquad j_1 = \frac{2(2\cdot 8 - 8 + 1) - 1}{2} \approx 8.5$$

$$k_1 = \frac{2(2\cdot 10 - 10 + 1) - 1}{2} \rightarrow \frac{21}{2} \qquad k_1 = \frac{2(2\cdot 10 - 10 + 1) - 1}{2} \approx 10.5$$

Figure (4) pass over points for multi full cycles for non-Imaginary unit circle partitioned by D =2



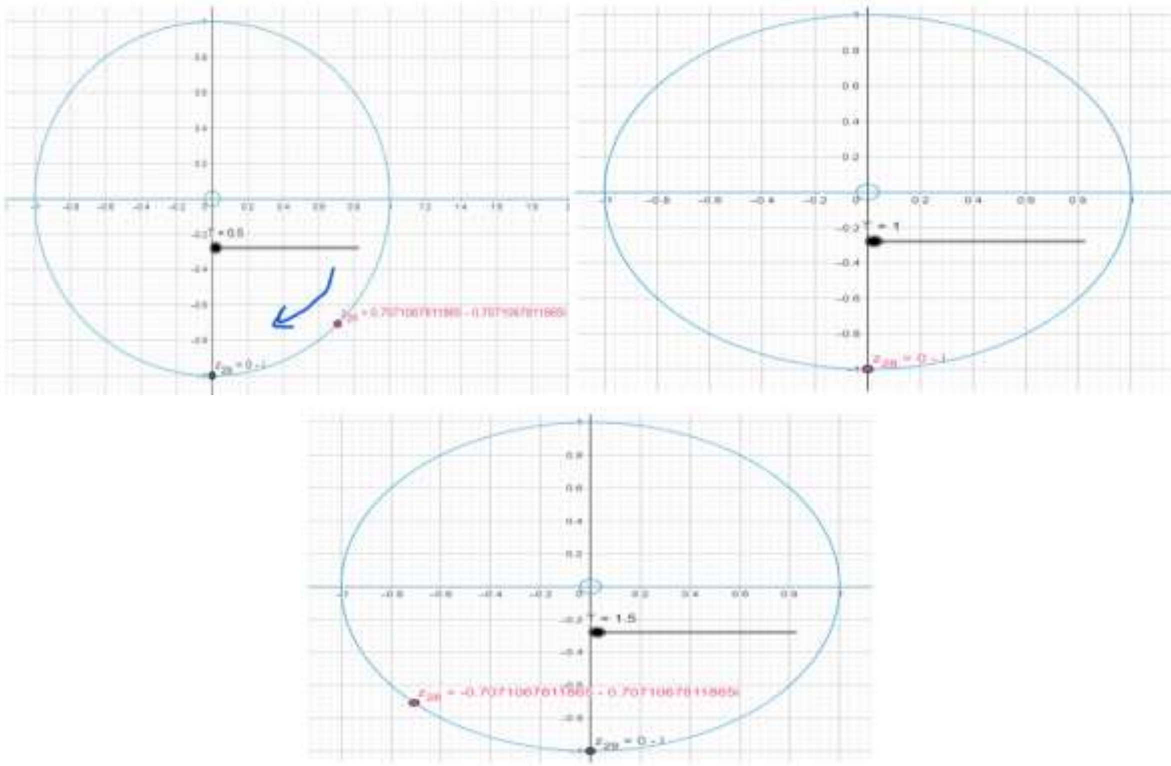


Figure (5). complex numbers and how they move across partitions of non-imaginary circle and how it will reach our start point Z29

Example (2): In non-Imaginary unit circle world At D = 4 and T = D-1 =3

Partitioning the non-Imaginary unit circle by 2 * D = 8, Which means once we reach partition number 8, we are going to go back to the exact complex number gain after one full circle on the non-imaginary circle world. Which also means when we are applying our partition formulas, we get complex numbers which moves on the non-Imaginary unit circle world with difference in between with step = 8

So, for T = (3,11,19,27, 35 …} Then T meats our partition= T/D at {3/4 ,11/4, 19/4, 27/4, 35/4, ….}

Where start point in this example is g1 =T/D= 3/4. where T = D -1 at start point.

One note here the 2* N values of the formula to find start point will be {+2, +4, +6, +8, +10, +12, ….}

And for multi full cycles we pass over the starting point at each {(3/4), (3/4) +2, (3/4) +4, (3/4) +6, (3/4) +8….} where (3/4) is the start point.

$i14 = \frac{4\,(2 \cdot 1 - 1) - 1}{4} \rightarrow \frac{3}{4}$	$i14 = \frac{4\,(2 \cdot 1 - 1) - 1}{4} \approx 0.75$
$et = \frac{4\,(2 \cdot 2 - 2 + 1) - 1}{4} \rightarrow \frac{11}{4}$	$et = \frac{4\,(2 \cdot 2 - 2 + 1) - 1}{4} \approx 2.75$
$it = \frac{4\,(2 \cdot 4 - 4 + 1) - 1}{4} \rightarrow \frac{19}{4}$	$it = \frac{4\,(2 \cdot 4 - 4 + 1) - 1}{4} \approx 4.75$
$c_1 = \frac{4\,(2 \cdot 6 - 6 + 1) - 1}{4} \rightarrow \frac{27}{4}$	$c_1 = \frac{4\,(2 \cdot 6 - 6 + 1) - 1}{4} \approx 6.75$
$d_1 = \frac{4\,(2 \cdot 8 - 8 + 1) - 1}{4} \rightarrow \frac{35}{4}$	$d_1 = \frac{4\,(2 \cdot 8 - 8 + 1) - 1}{4} \approx 8.75$
$e_1 = \frac{4\,(2 \cdot 10 - 10 + 1) - 1}{4} \rightarrow \frac{43}{4}$	$e_1 = \frac{4\,(2 \cdot 10 - 10 + 1) - 1}{4} \approx 10.75$

Figure (6). Pass over points for multi full cycles for non-Imaginary unit circle partitioned by D =4

At D = 4; In imaginary unit Circle world the start fixed point will be at complex number [Z27] and will be [i14] in non-Imaginary unit circle world.

$z_{27} = -e^{\frac{\pi}{4} i}$ $\rightarrow$ -0.7071067811865 - 0.7071067811865(	$i14 = \frac{4\,(2 \cdot 1 - 1) - 1}{4} \rightarrow \frac{3}{4}$

Same complex number will be in non-Imaginary unit circle world at D = 4 and T = 3

Will reach exact start point (at complex number Z27) for partitioning with D = 4 at our formula (i14)

And every 8 steps we are going to go back to this exact imaginary point gain after one full circle on the non-imaginary circle.

Next two-time pass (full cycle) over point Z27 will be at T = T + 8 = 3 +8 = 11 and at T = T + 8 = 11 +8 = 19

$et = \frac{4\,(2 \cdot 2 - 2 + 1) - 1}{4} \rightarrow \frac{11}{4}$	$it = \frac{4\,(2 \cdot 4 - 4 + 1) - 1}{4} \rightarrow \frac{19}{4}$

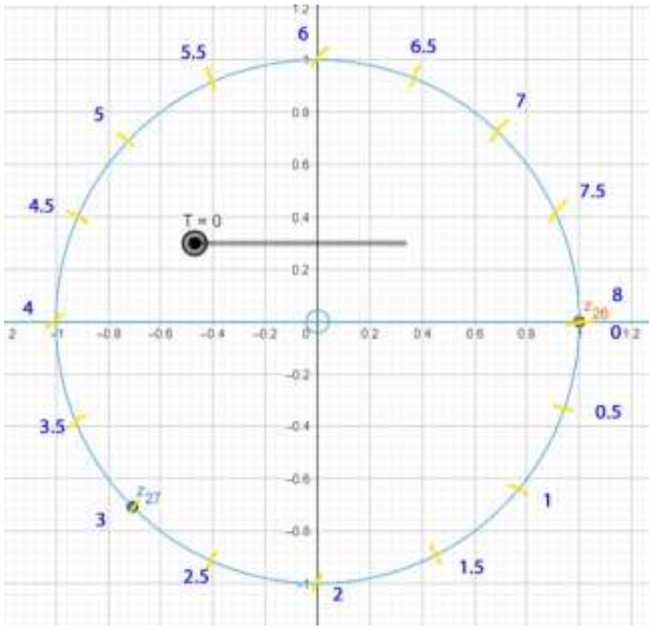


Figure (7) partitioning the non-Imaginary unit circle by D =4

Example (3): In non-Imaginary unit circle world At D = 7 and T = D-1 =6

Partitioning the non-Imaginary unit circle by 2 * D = 14, Which means once we reach partition number 14, we are going to go back to the exact complex number gain after one full circle on the non-imaginary circle world. Which also means when we are applying our partition formulas, we get complex numbers which moves on the non-Imaginary unit circle world with difference in between with step = 14.

So, for T = (6, 20, 34, ,48, 62 …} Then T meats our partition= T/D at {6/7 ,20/7, 34/7, 48/7, 62/7, ….}

Where start point in this example is g1 =T/D= 6/7. where T = D -1 at start point.

One note here the N values of the formula to find start point will be {+1, +2, +3, +4, +5, +6, ….}

And for multi full cycles we pass over the starting point at each {(6/7), (6/7) +2, (6/7) +4, (6/7) +6, (6/7) +8….} where (6/7) is the start point.

$$e_2 = \frac{7\,(3\cdot 0 - 0 + 1) - 1}{7} = \frac{6}{7}$$

$$f_2 = \frac{7\,(3\cdot 1 - 1 + 1) - 1}{7} = \frac{20}{7}$$

$$g_2 = \frac{7\,(3\cdot 2 - 2 + 1) - 1}{7} = \frac{34}{7}$$

$$h_2 = \frac{7\,(3\cdot 3 - 3 + 1) - 1}{7} = \frac{48}{7}$$

$$i_2 = \frac{7\,(3\cdot 4 - 4 + 1) - 1}{7} = \frac{62}{7}$$

$$j_2 = \frac{7\,(3\cdot 5 - 5 + 1) - 1}{7} = \frac{76}{7}$$

$$d_2 = \frac{6}{7} \approx 0.8571428571429$$

$$e_2 = \frac{7\,(3\cdot 0 - 0 + 1) - 1}{7} \approx 0.8571428571429$$

$$f_2 = \frac{7\,(3\cdot 1 - 1 + 1) - 1}{7} \approx 2.8571428571429$$

$$g_2 = \frac{7\,(3\cdot 2 - 2 + 1) - 1}{7} \approx 4.8571428571429$$

$$h_2 = \frac{7\,(3\cdot 3 - 3 + 1) - 1}{7} \approx 6.8571428571429$$

$$i_2 = \frac{7\,(3\cdot 4 - 4 + 1) - 1}{7} \approx 8.8571428571429$$

$$j_2 = \frac{7\,(3\cdot 5 - 5 + 1) - 1}{7} \approx 10.8571428571429$$

Figure (8). Pass over points for multi full cycles for non-Imaginary unit circle partitioned by D =7

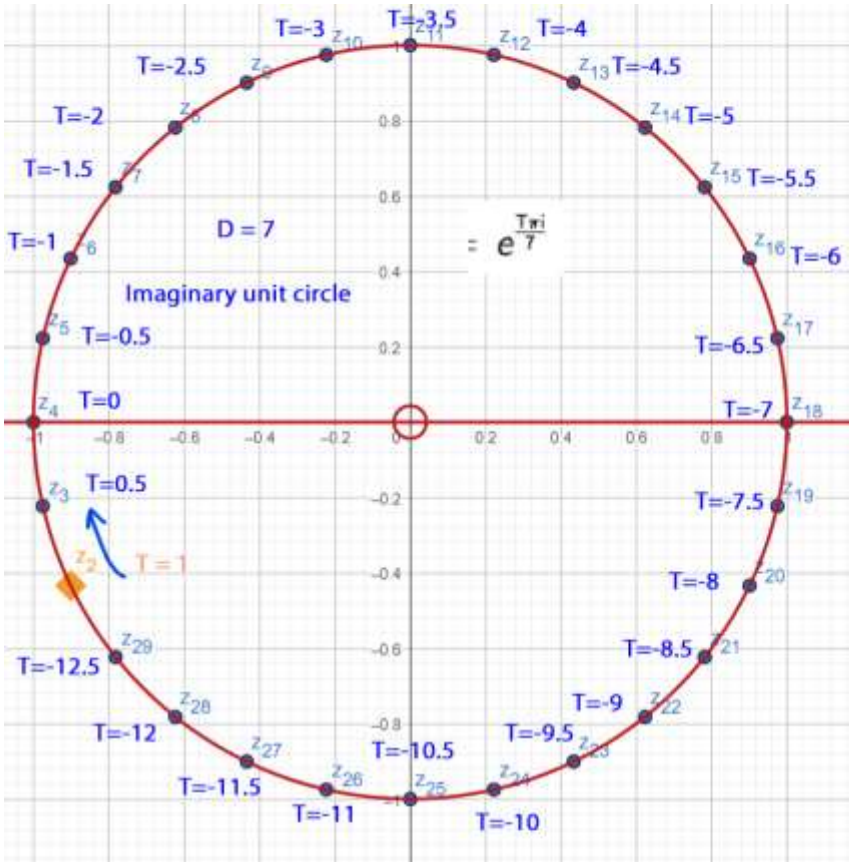


Figure (9). Partitioning the Imaginary unit circle; $f(T, D) = -e^{\frac{T*\pi*i}{D}}$; by D =7

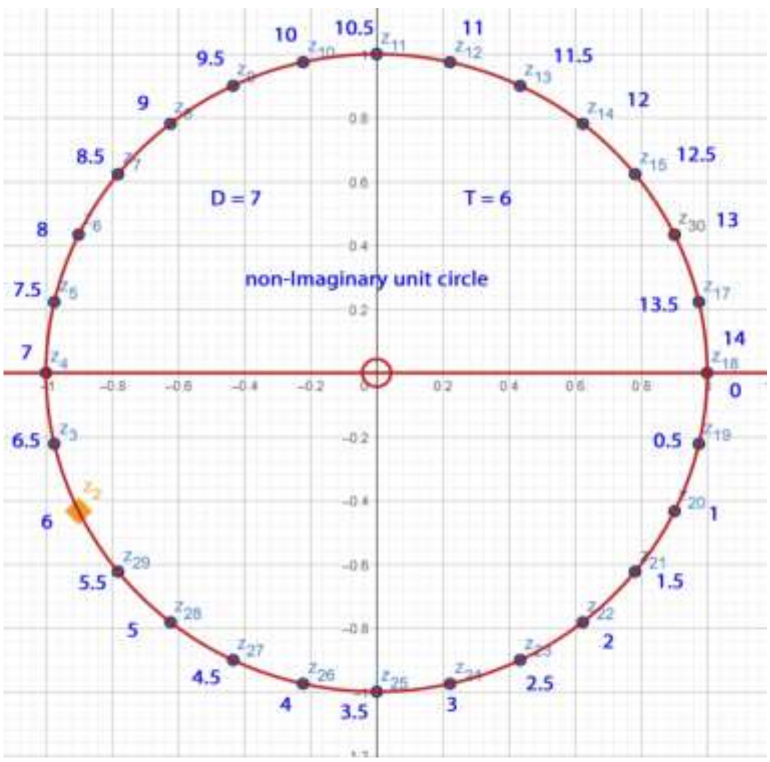


Figure (10). Partitioning the non-Imaginary unit circle by D =7 and T =6

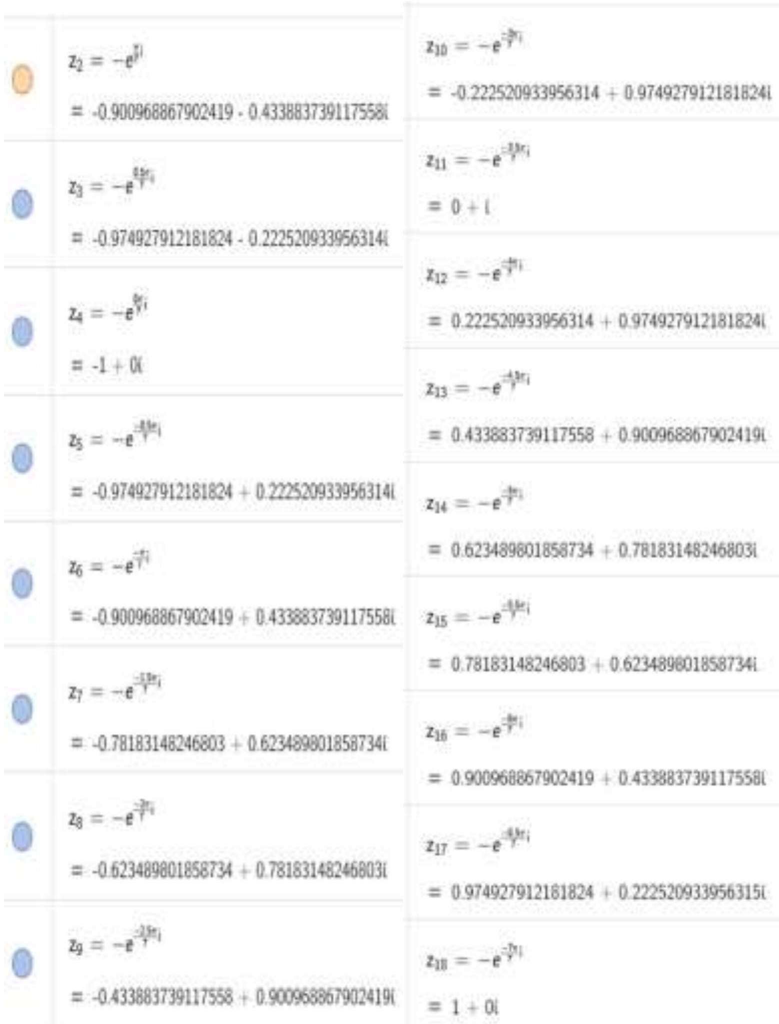


Figure (11). Complex numbers on Imaginary unit circle partitioned by D =7

Figure (12). Complex numbers on Imaginary unit circle partitioned by D =7

For Odd Divisions D = odd number

imaginary Circle [-i] $at\ D = 7;\ e^{-\frac{3.5*\pi*i}{7}}$ all the time will be at D/2

imaginary Circle [i] at D = 7; $e^{-\frac{20.5*\pi*i}{7}}$ will be at [3*D/2]

imaginary Circle [1] at D = 7; $e^{-\frac{2*7*\pi*i}{7}}$ all the time will be D * 2^N

Imaginary Circle [-1] at $D = 7;\ e^{-\frac{7*\pi*i}{7}}$ all the time will be D * (2^N+1)

Start Point at D -1 at Division = 6 i.e., we divide the angel between Z21 at Zero and e4, into 12 equal angels and this will be our angel in non-imaginary Circle

Point (3): angel in non-imaginary Circle $=\frac{\frac{T*\pi}{D}}{2*(D-1)} = \frac{\frac{(D-1)*\pi}{D}}{2*(D-1)} = \frac{\pi}{2*(D)}$

for D = 7 we need to divide 180 by 14 θ = $\frac{180}{14}=\frac{90}{7}$ and if divide 360 by 14 θ = $\frac{360}{14}=\frac{180}{7}$

for D = 5 we need to divide 180 by 10 θ = $\frac{180}{10}=\frac{90}{5}$ and if divide 360 by 10 θ = $\frac{360}{10}=\frac{180}{5}$

for D = 9 we need to divide 180 by 18 θ = $\frac{180}{18}=\frac{90}{9}$ and if divide 360 by 18 θ = $\frac{360}{18}=\frac{180}{9}$

for D = 11 we need to divide 180 by 22 θ = $\frac{180}{22}=\frac{90}{11}$ and if divide 360 by 22 θ = $\frac{360}{22}=\frac{180}{11}$

for D = 13 we need to divide 180 by 26 θ = $\frac{180}{26}=\frac{90}{13}$ and if divide 360 by 26 θ = $\frac{360}{26}=\frac{180}{13}$

for D = 17 we need to divide 180 by 34 θ = $\frac{180}{34}=\frac{90}{17}$ and if divide 360 by 34 θ = $\frac{360}{34}=\frac{180}{17}$

for D = 19 we need to divide 180 by 38 θ = $\frac{180}{38}=\frac{90}{19}$ and if divide 360 by 38 θ = $\frac{360}{38}=\frac{180}{19}$

for D = 23 we need to divide 180 by 46 θ = $\frac{180}{46}=\frac{90}{23}$ and if divide 360 by 64 θ = $\frac{360}{64}=\frac{180}{23}$

This means that after each (D * θ) we are going to reach Zero at θ = 180 (Sin (180) = -1) at X = -1.

Or after (D* θ/2) we are going to reach imaginary part only and real part will be Zero at θ = 90 and X = 0 (Cos (90) = 0)

Or we can say that $\frac{\frac{D}{2} * 360}{D}$ = 180, for all values of D.

So, for any Divisions [D] even or odd it will reach Zero at X = -1 and Sin (180).

Example (5): In non-Imaginary unit circle world At D = 13 and T = D-1 =12

Partitioning the non-Imaginary unit circle by 2 * D = 26, Which means once we reach partition number 26, we are going to go back to the exact complex number gain after one full circle on the non-imaginary circle world. Which also means when we are applying our partition formulas, we get complex numbers which moves on the non-Imaginary unit circle world with difference in between with step = 26

So, for T = (12, 38, 64, 90, 116, 142 …} Then T meats our partition= T/D at {12/13 ,38/13, 64/13, 90/13, 116/13, ….}

Where start point in this example is g1 =T/D= 12/13. where T = D -1 at start point.

One note here the N values of the formula to find start point will be {+1, +2, +3, +4, +5, +6, ….}

And for multi full cycles we pass over the starting point at each {(12/13), (12/13) +2, (12/13) +4, (12/13) +6, (12/13) +8….} where (12/13) is the start point.

$$e1 = \frac{13 \cdot 1 - 1}{13} \rightarrow \frac{12}{13} \qquad e1 = \frac{13 \cdot 1 - 1}{13} \approx 0.9230769230769$$

$$i2 = \frac{13\,(3 \cdot 1 + 1 - 1) - 1}{13} \rightarrow \frac{38}{13} \qquad i2 = \frac{13\,(3 \cdot 1 + 1 - 1) - 1}{13} \approx 2.9230769230769$$

$$i5 = \frac{13\,(3 \cdot 2 - 2 + 1) - 1}{13} \rightarrow \frac{64}{13} \qquad i5 = \frac{13\,(3 \cdot 2 - 2 + 1) - 1}{13} \approx 4.9230769230769$$

$$k = \frac{13\,(3 \cdot 3 - 3 + 1) - 1}{13} \rightarrow \frac{90}{13} \qquad k = \frac{13\,(3 \cdot 3 - 3 + 1) - 1}{13} \approx 6.9230769230769$$

$$l = \frac{13\,(3 \cdot 4 - 4 + 1) - 1}{13} \rightarrow \frac{116}{13} \qquad l = \frac{13\,(3 \cdot 4 - 4 + 1) - 1}{13} \approx 8.9230769230769$$

$$a_1 = \frac{13\,(3 \cdot 5 - 5 + 1) - 1}{13} \rightarrow \frac{142}{13} \qquad a_1 = \frac{13\,(3 \cdot 5 - 5 + 1) - 1}{13} \approx 10.9230769230769$$

Figure (13). Pass over points for multi full cycles for non-Imaginary unit circle partitioned by D =13

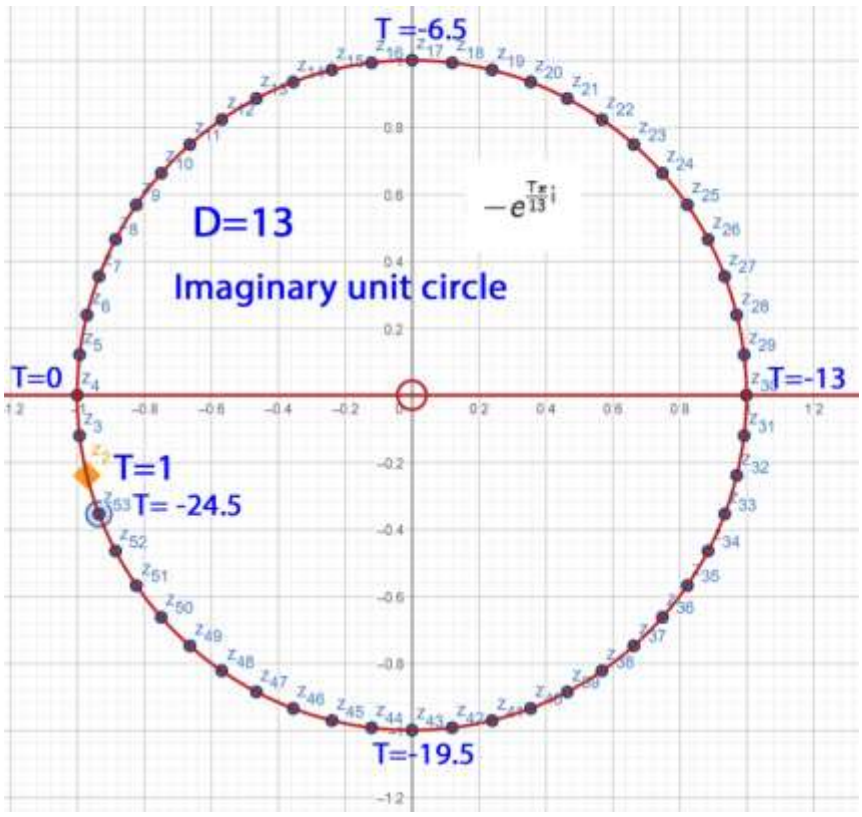


Figure (14). partitioning the Imaginary unit circle; $f(T,D) = -e^{\frac{T*\pi*i}{D}}$; by D =13

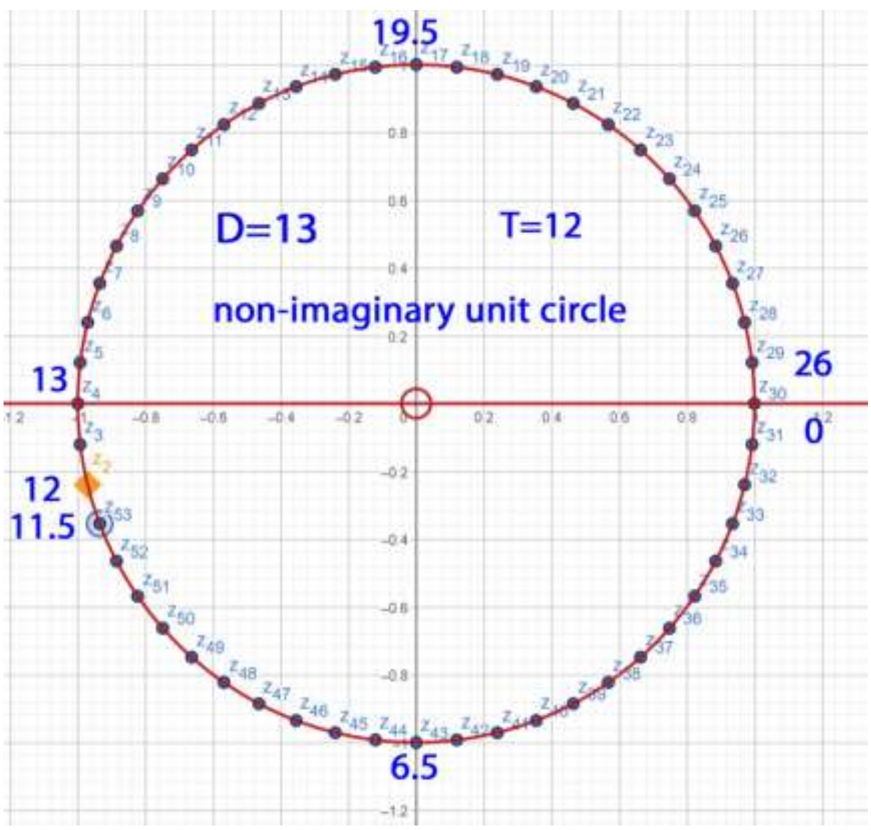


Figure (15). partitioning the non-Imaginary unit circle by D =13 and T =12

4. Spin Difference Between Non-Imaginary Unit Circle Partitions and Imaginary Unit Circle Partitions

Both worlds the non-Imaginary unit circle partitions and Imaginary unit circle partitions meets at the same points but there is a rotation (spin) of the unit circle axes is done for both axes for both worlds to meet at the same points

And this is due to the negative signal used in $f(T,D) = -e^{\frac{T*\pi*i}{D}}$; if we used $f(T,D) = e^{\frac{T*\pi*i}{D}}$ without the negative sign both world unit circle will be identical without any spin.

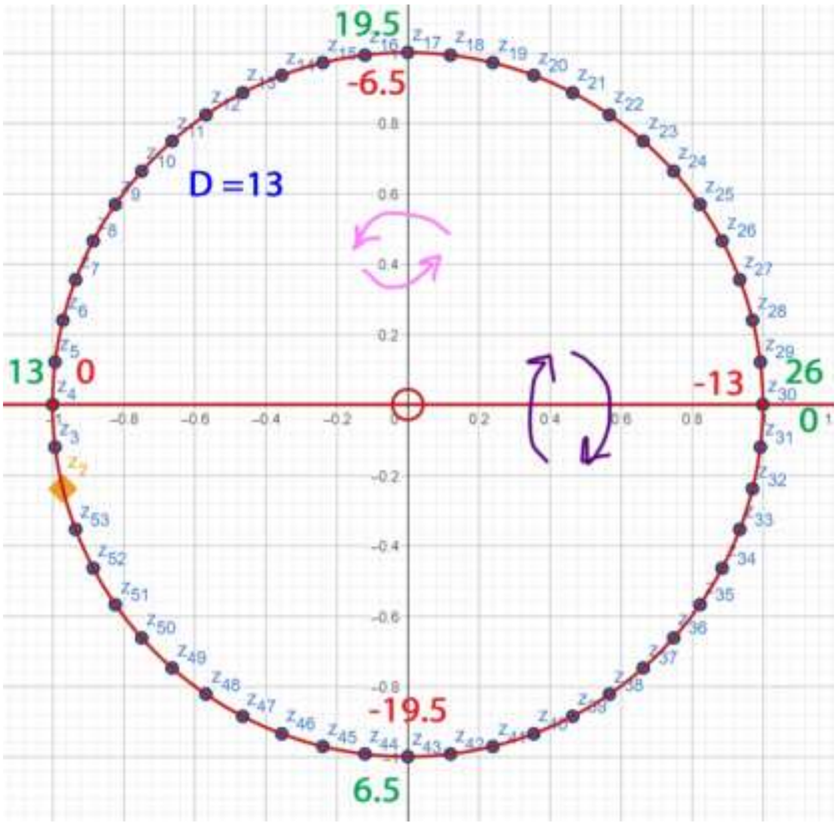
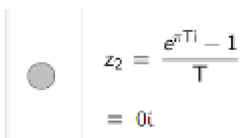


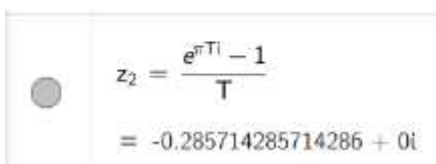
Figure (16). Spin difference between partitioning the non-Imaginary and the imaginary unit circle for D =13

5. Imaginary Unit Circle Initial Division State at D =T= 2

1) for any Even Natural Number value for T; Z2 = 0; as long as $e^{i*\pi*T} - 1 = 0\,; for\ any\ even\ value\ for\ T$

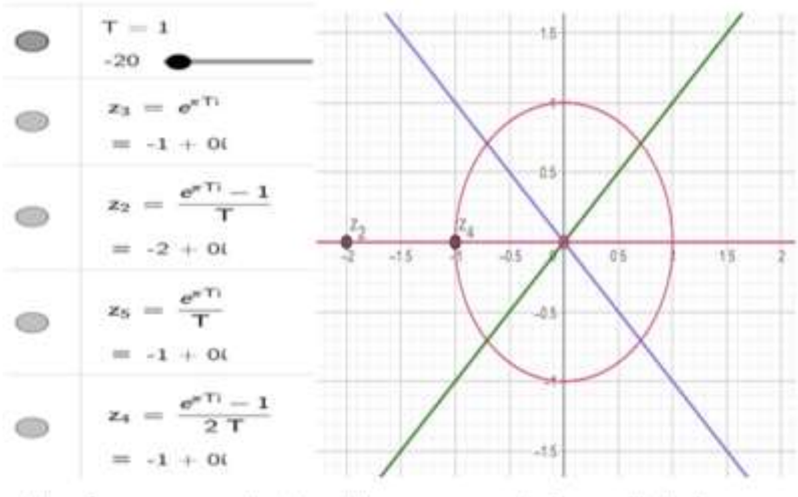


2) for any odd Natural Number value for T; $Z2 = \frac{-2}{T}$



$$f1(T) = \begin{cases} \dfrac{e^{\pi*i*T} - 1}{T} = 0 * i\,, & for\ Even\ Natural\ Numbers \\ \dfrac{e^{\pi*i*T} - 1}{T} = \dfrac{-2}{T} \pm 0 * i, & for\ Odd\ Natural\ Numbers \end{cases}$$

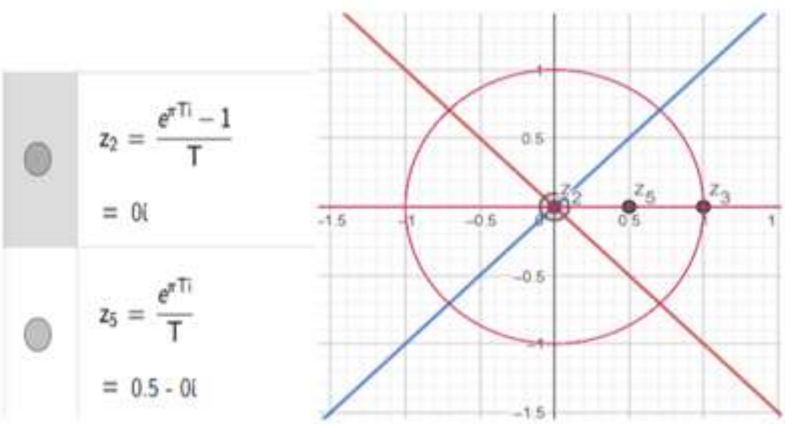
$$f2(T) = \begin{cases} \frac{e^{\pi * i * T}}{T} = \frac{1}{T} + 0 * i\,, & for\ Even\ Natural\ Numbers \\ \frac{e^{\pi * i * T}}{T} = \frac{-1}{T} + 0 * i, & for\ Odd\ Natural\ Numbers \end{cases}$$



F1(T) = 0; for any even Natural number and have no Imaginary value for any odd value for T.

F2(T) = 1/T; for any even natural number and f2(T) = -1/T; for any odd natural number with no imaginary value at all. (Oscillate between +ev and -ev side of x axes).

2) At T =2



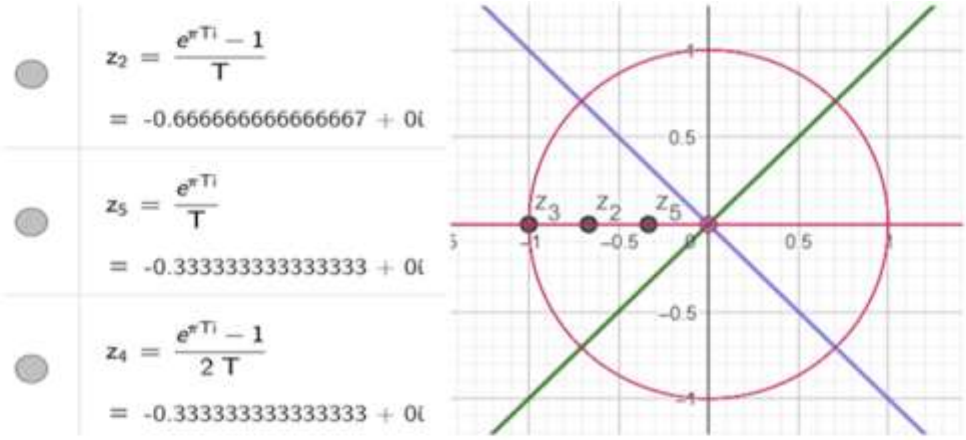
3) the effect of subracting one is the sam as divid by 2 or multiply by 0.5.

In point (2) the two versions of functions f(x) one of them uses $e^{i * \pi * T} - 1$ and the other one uses only $e^{i * \pi * T}$; and the version that have $e^{i * \pi * T} - 1$ the effect of subtract one is the same as divid by 2 because.

$$\frac{e^{\pi * i * T}}{T} = \frac{e^{\pi * i * T} - 1}{2 * T}\ ; for\ any\ Odd\ Natural\ number$$

This effect is not shown with even Natural numbers because it is equal zero for any natural even number.

For example, for T = 3 f(x) = 1/T or 2/T if we subtract one



It is clear that both points Z5 and Z4 are identical in values and in order to see them sepratly we are going to divid T by 2.

4) moving with step = ½ or divid T by 2; T = T /2

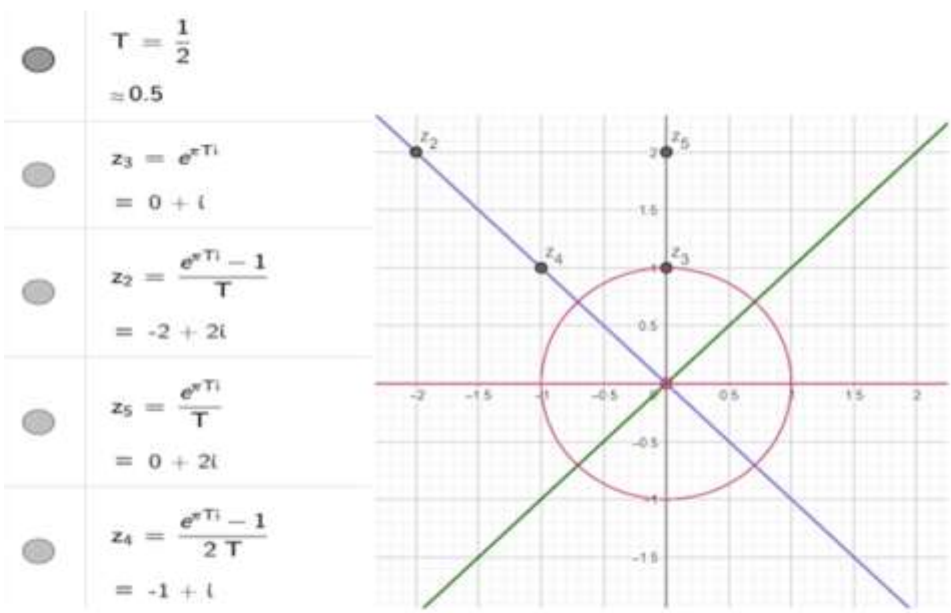
$$f1\left(T=\frac{N}{2}\right)=\begin{cases}\dfrac{e^{\pi*i*T}-1}{T}=0*i\,, & for\ T=\dfrac{N}{2};\ where\ N\ in\ \{4,8,12,16,20,24,\ldots.\}\\ \dfrac{e^{\pi*i*T}-1}{T}=\dfrac{\pm2}{N}\pm\dfrac{2}{N}*i\,, & for\ T=\dfrac{N}{2};where\ N\ any\ Odd\ Natural\ Number\\ \dfrac{e^{\pi*i*T}-1}{T}=\dfrac{\pm4}{N}\pm0*i\,, & for\ N=even\ Natural\ Numbers\ not\ in\ \{4,8,12,16,\ldots\}\end{cases}$$

$$f2\left(\frac{T}{2}\right)=\begin{cases}\dfrac{e^{\pi*i*T}}{T}=\dfrac{\pm2}{T}\pm0*i\,, & for\ Even\ Natural\ Numbers\\ \dfrac{e^{\pi*i*T}}{T}=0\pm(\dfrac{2}{T}*i)\,, & for\ Odd\ Natural\ Numbers\end{cases}$$

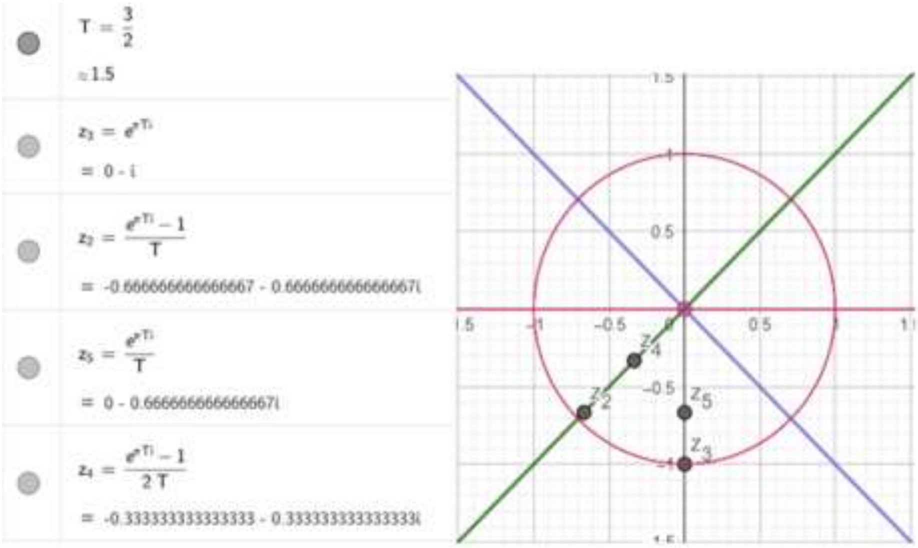
F2(T/2) even Natural numbers have only real values and no imaginary values and for odd natural numbers have only imaginary values and no real values.

F1(T/2) for N= odd Natural numbers will be on axes rotated by 45 degrees (i.e., will be a point on both Line y = x or y =-x)

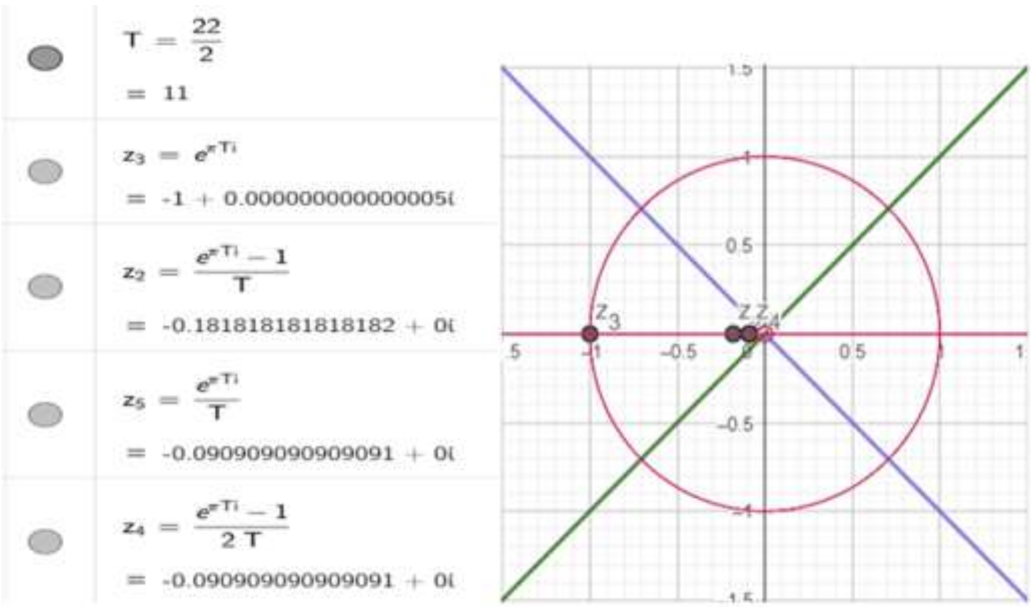
Example (1): N = 1; T =N/2 = 1/2



Example (2): N =3 ; T = N/2 = 3/2



Example (3) N = 22; evene number ; T =N/2 = 22/2



In conclusion F2(T) for odd numbers has only real values and no imaginary values but if we divide T by 2 or multiply by 0.5, we only have imaginary values and no real values for odd numbers.

And F1(T) for odd numbers has value equal double the reciprocal of T and if we divide it by 2 or multiply by 0.5; we will get both imaginary and real values both equal to reciprocal of T.

Conclusion

1- Any unit Circle non-imaginary can be partitioned into D partitions, where D is any natural number or partitions.

2- For Any partition D we will reach Zero at X =0 and Sin (180) for even or odd partitions.

3- Imaginary unit Circle matches non-Imaginary unit Circle at 4 important points.

complex number with imaginary part [-i] $at\ D\ partitions;\ e^{-\frac{D/2*\pi*i}{D}}$ all the time will be at D/2

complex number with imaginary part [i] $at\ D\ partitions;\ e^{-\frac{3*D/2*\pi*i}{D}}$will be at [3*D/2] complex number with real part = [1] at D Partitions; $e^{-\frac{2*D*\pi*i}{D}}$ all the time will be D * 2^N

complex number with real part= [-1] at $D\ Partitions$; $e^{-\frac{D*\pi*i}{D}}$ all the time will be D * (2^N+1)

4- Start point will be at [$\frac{D-1}{D}$] at T = [D-1] with (pass over) step = 2 * D.

5- Start Point will be at D-1.

6- Start point will be 2 * θ before D reaches 180 at X = -1

7- Odd/even number of partitions will be at [-i] at [D/2] on unit circle.

8- Odd/even number of partitions will be at [i] at [3*D/2] on unit circle.

9- Odd number of partitions have only imaginary part [-i] and [i] at $\frac{(D-1)}{2} + \frac{1}{2}$

10- Also, we showed that in the initial state division of the imaginary unit circle(D=2) for any odd natural number we will have only imaginary part for any T = N/2.

$$f1\left(T = \frac{N}{2}\right) = \begin{cases} \dfrac{e^{\pi*i*T} - 1}{T} = 0 * i \,, & for\ T = \dfrac{N}{2};\ where\ N\ in\ \{4,8,12,16,20,24, \ldots.\} \\ \dfrac{e^{\pi*i*T} - 1}{T} = \dfrac{\pm 2}{N} \pm \dfrac{2}{N} * i \,, & for\ T = \dfrac{N}{2}; where\ N\ any\ Odd\ Natural\ Number \\ \dfrac{e^{\pi*i*T} - 1}{T} = \dfrac{\pm 4}{N} \pm 0 * i \,, & for\ N = even\ Natural\ Numbers\ not\ in\ \{4,8,12,16, \ldots\} \end{cases}$$

$$f2\left(\frac{T}{2}\right) = \begin{cases} \dfrac{e^{\pi*i*T}}{T} = \dfrac{\pm 2}{T} \pm 0 * i \,, & for\ Even\ Natural\ Numbers \\ \dfrac{e^{\pi*i*T}}{T} = 0 \pm (\dfrac{2}{T} * i) \,, & for\ Odd\ Natural\ Numbers \end{cases}$$

F2(T/2) even Natural numbers have only real values and no imaginary values and for odd natural numbers have only imaginary values and no real values.

F1(T/2) for N= odd Natural numbers will be on axes rotated by 45 degrees (i.e., will be a point on both Line y = x or y =-x); Which gives us a hit why all nontrivial zeros of zeta function are at the critical line. as for any odd number we only have imaginary part and the analytical continuity in summary was doing multiply by 0.5 (i.e., shift on axes by 0.5)

References

Filipkiewicz, R. (1982). Isomorphisms between diffeomorphism groups. *Ergodic Theory and Dynamical Systems, 2*(2), 159-171.

Mann, K. (2021). The Structure of Homeomorphism and Diffeomorphism Groups. *AMERICAN MATHEMATICAL SOCIETY, 68*(4). https://doi.org/10.1090/noti2252

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