

$$f_1(z) = \frac{1}{2} z(\cos\theta + i\sin\theta)$$

$$f_2(z) = \frac{1}{2} z(\cos\theta + i\sin\theta) + \frac{1}{2}$$

$$f_3(z) = \left(\frac{1}{2}z + \frac{1}{2}i\right)(\cos\theta + i\sin\theta)$$

```
=IMPRODUCT(IMPRODUCT(A6,0.5),COMPLEX(COS($A$5),SIN($A$5)))
)
=IMSUM(IMPRODUCT(IMSUM(IMPRODUCT(A6,0.5),COMPLEX(0,0.5)),
COMPLEX(COS($A$5),SIN($A$5))),COMPLEX(0.5,0))
=IMPRODUCT(IMSUM(IMPRODUCT(A6,0.5),COMPLEX(0,0.5)),COMPL
EX(COS($A$5),SIN($A$5)))
```

Excel 複素数A,Bの加減乗除

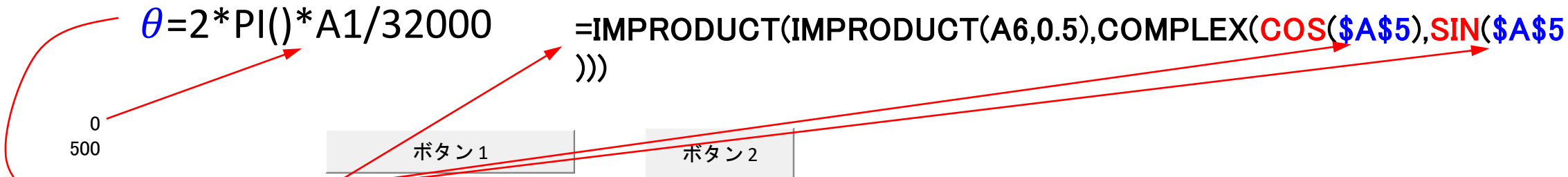
- A+B IMSUM(A,B)
- A-B IMSUB(A,B)
- A × B IMPRODUCT(A,B)

a+biは、COMPLEX(a,b)で表せる

	$f_1(z)$	$f_2(z)$	$f_3(z)$	$f_{11}(z)$	$f_{12}(z)$	$f_{13}(z)$	$f_{21}(z)$	$f_{22}(z)$	$f_{23}(z)$	$f_{31}(z)$	$f_{32}(z)$	$f_{33}(z)$
0.0	0.002398023	-0.49760197	0.002398023	-0.02422085478	-0.002968831884250		-0.04867628837	0.119638895186607				
0	<u>0.002398023445</u>			-0.024220854781785			-0.02182283133	-0.027189686666035				
0				-0.04627826493	0.0954180404048216		-0.49760197655	-0.048676288376095				
				-0.52182283133	-0.051645120260345		-0.54627826493	<u>0.0709626068105117</u>				
					0.0023980234455879			-0.000570808438661				
					0.122036918632196+			-0.021822831336197				
					-0.024791663220447			0.097816063850411+				
					-0.046278264930507			-0.049247096814757				
					<u>0.073360630256101-</u>			-0.497601976554412				

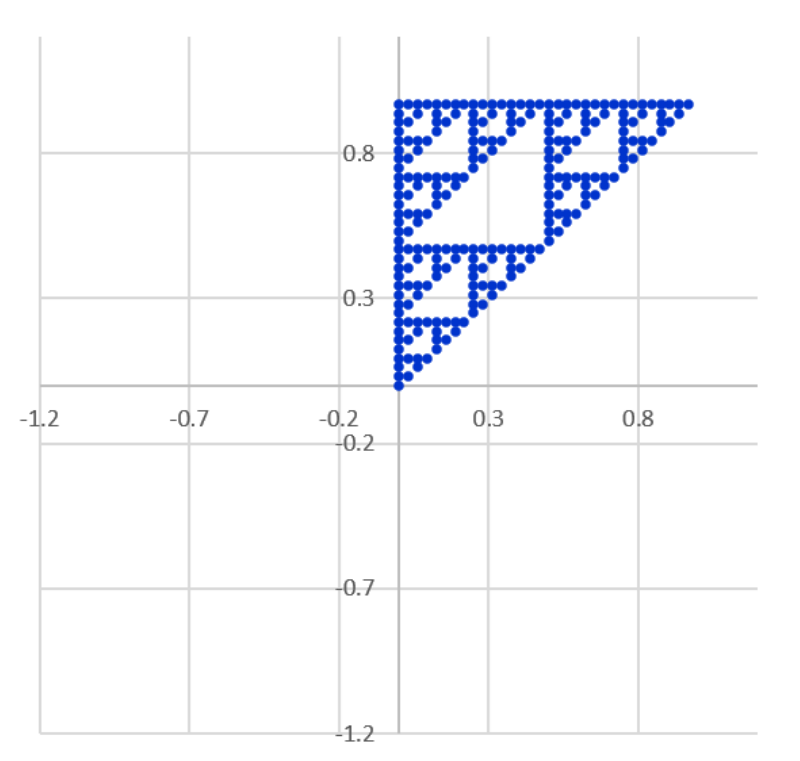
θ が0から 2π まで変化させて図形を動かす

$$f_1(z) = \frac{1}{2}z(\cos\theta + i\sin\theta)$$



						実部	虚部
0	0	0	0	0	0	0	0
0.5+0.5i	0.25+0.25i	0.125+0.125i	0.0625+0.0625i	0.03125+0.03125i	0.03125	0.03125	
0.5i	0.25i	0.125i	0.0625i	0.03125i	0	0.03125	
	0.5+0.5i	0.25+0.25i	0.125+0.125i	0.0625+0.0625i	0.0625	0.0625	
	0.75+0.75i	0.375+0.375i	0.1875+0.1875i	0.09375+0.09375i	0.09375	0.09375	
	0.5+0.75i	0.25+0.375i	0.125+0.1875i	0.0625+0.09375i	0.0625	0.09375	
	0.5i	0.25i	0.125i	0.0625i	0	0.0625	
	0.25+0.75i	0.125+0.375i	0.0625+0.1875i	0.03125+0.09375i	0.03125	0.09375	
	0.75i	0.375i	0.1875i	0.09375i	0	0.09375	
	0.5+0.5i	0.25+0.25i	0.125+0.125i		0.125	0.125	
	0.625+0.625i	0.3125+0.3125i	0.15625+0.15625i		0.15625	0.15625	
	0.5+0.625i	0.25+0.3125i	0.125+0.15625i		0.125	0.15625	
	0.75+0.75i	0.375+0.375i	0.1875+0.1875i		0.1875	0.1875	
	0.875+0.875i	0.4375+0.4375i	0.21875+0.21875i		0.21875	0.21875	
	0.75+0.875i	0.375+0.4375i	0.1875+0.21875i		0.1875	0.21875	

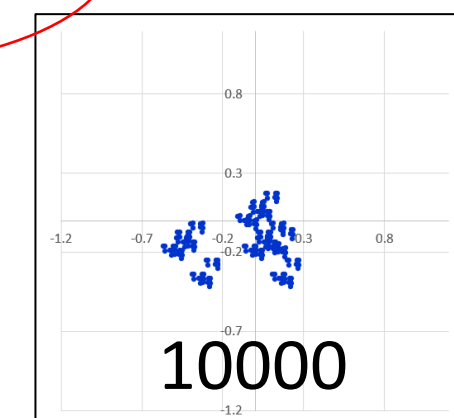
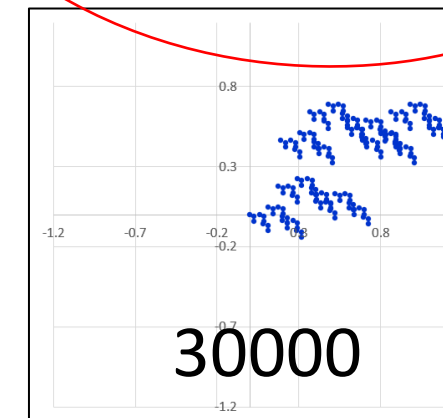
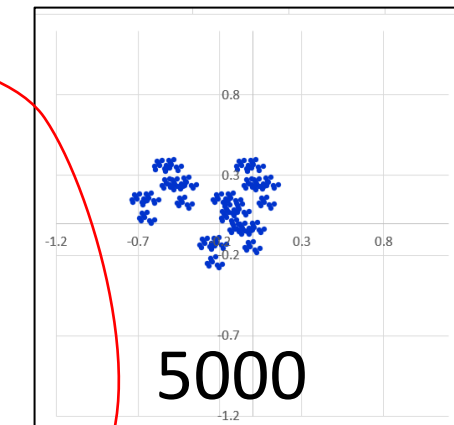
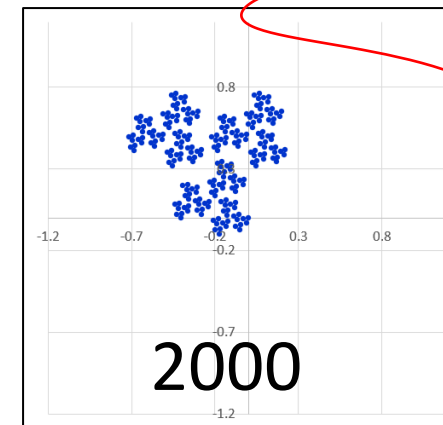
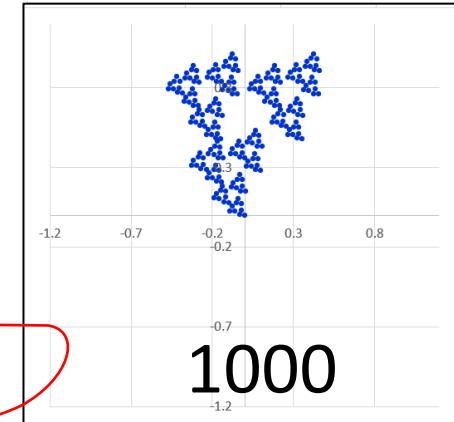
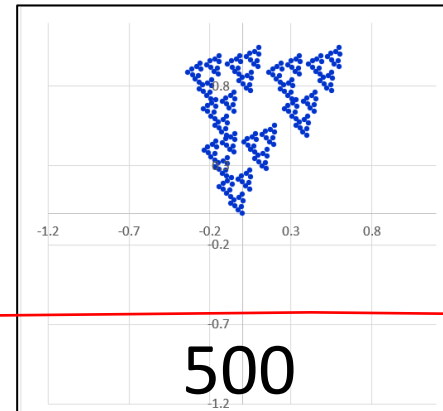
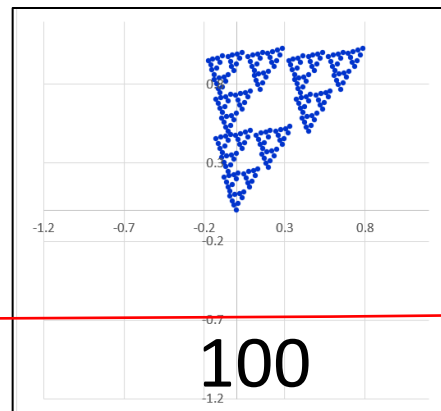
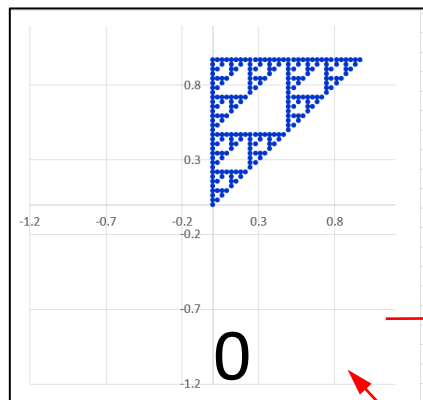
$z=0$ のときの実行結果



```

Option Explicit
Public Run As Boolean
Sub ボタン1_Click()
    Dim x As Integer
    Run = True
    Do While (Run = True)
        x = Cells(1, 1)
        x = x + Cells(2, 1)
        If x > 32000 Then
            x = 1
        End If
        Cells(1, 1) = x
        DoEvents
        ActiveSheet.ChartObjects(1).Activate ' グラフをアクティブにする
        Application.Wait (Now + TimeValue("0:00:01")) ' 1秒待機する
    Loop
End Sub
Sub ボタン2_Click()
    Run = False
End Sub

```



ActiveSheet.ChartObjects(1).Activate ' グラフをアクティブにする
Application.Wait (Now + TimeValue("0:00:01")) ' 1秒待機する