Unit n°66

Supplement 3

Check more

P1

$$x = \sqrt{a} + \sqrt{b} + \sqrt{c}$$

$$z = x^2$$

rec. z

$$z := z - \frac{[(z-A)^2 - 4B]^2 - 64Cz}{4(z-A)[(z-A)^2 - 4B] - 64C}$$

A=a+b+c ; B=ab+ac+bc ; C=abc (S3.1)

Example P1.1

a = 9; b = 25; c = 49; z(0) = 0,1,2,3,…

Expected z(inf)

$(sqr(9) + sqr(25) + sqr(49))^2 = 225$

$(sqr(9) - sqr(25) + sqr(49))^2 = 25$

$(sqr(9) + sqr(25) - sqr(49))^2 = 1$

$(sqr(9) - sqr(25) - sqr(49))^2 = 81$

depending on z(0).

Realized z(inf)

z(0) = 0(1)11	z(inf) = 1
z(0) = 12	z(inf) = 225
z(0) = 13	z(inf) = 81
z(0) = 14(1)47	z(inf) = 25
z(0) = 48(1)57	z(inf) = 1
z(0) = 58(1)60	z(inf) = 225
z(0) = 61(1)162	z(inf) = 81
z(0) = 163	225
z(0) = 164	1
z(0) = 165(1)168	25
z(0) = 169	81
z(0) = 170(1)179	1
z(0) = 180(1)2000	225

Example P1.2

a=sqr(2); b=sqr(3); c=sqr(5); z(0)=0,1,2,3,…

Expected z(inf)

$(sqr(sqr(2)) + sqr(sqr(3)) + sqr(sqr(5)))^2$ =

16.005039670197043111436576531712642905592326607015…

$(sqr(sqr(2)) - sqr(sqr(3)) + sqr(sqr(5)))^2$ =

1.872742664842172170941725717951789835257026476192 2…

$(sqr(sqr(2)) + sqr(sqr(3)) - sqr(sqr(5)))^2$ =

1.019963344979630232377982933815809695556772141682 3…

$(sqr(sqr(2)) - sqr(sqr(3)) - sqr(sqr(5)))^2$ =

2.631583709748202640196949754307144287406256730306 4…

depending on z(0).

Realized z(inf)

z(0) = 0,1	z(inf) =1.0199633449796…
z(0) = 2	z(inf) =1.8727426648421…
z(0) = 3(1)11	z(inf) =2.6315837097482…
z(0) = 12	z(inf) =1.0199633449796…
z(0) = 13(1)??	z(inf) =16.005039670197…

A very difficult problem:
Find the relationship between a, b, c, z(0) and z(inf)=(+sqr(a)○sqr(b)Δsqr(c))^2, basing on the above tables.

P2

$$x = \sqrt{a} + \sqrt{b}$$

$$z = x^2$$

rec. z

$$z := z - \frac{z^2 - 2(a+b)z + (a-b)^2}{2z - 2(a+b)}$$

$$:= \frac{z^2 - (a-b)^2}{2(z-(a+b))} \qquad \text{(S3.2)}$$

Example P2.1

a = 3; b = 5; z(0) = 0,1,2,3,…

Expected z(inf)

$(\text{sqr}(3) + \text{sqr}(5))^2 = 15.74596669\ldots$

$(\text{sqr}(3) - \text{sqr}(5))^2 = 0.254033307\ldots$

depending on z(0).

Realized z(inf)

z(0)=0(1)7	$z(\text{inf})=(\text{sqr}(2)-\text{sqr}(3))^2=0.254\ldots$
z(0)=8	indef.
z(0)=9(1)inf	$z(\text{inf})=(\text{sqr}(2)+\text{sqr}(3))^2=15.74\ldots$

Example P2.2

a = 7; b = 63; z(0) = 0,1,2,3,…

z(0)=0(1)69	$z(\text{inf}) = (\text{sqr}(7)-\text{sqr}(63))^2 = 28$
z(0)=70	indef.
z(0)=71(1)inf	$z(\text{inf}) = (\text{sqr}(7)+\text{sqr}(63))^2 = 112$

A very difficult problem:

Find the relationship between a, b, z(0) and

$z(\text{inf})=(+\text{sqr}(a)\circ\text{sqr}(b))^2$,

basing on the above two examples.