幾何数学日記2　76日

晩秋　山の向こうに

蛭子井博孝編著

夢一つ見て夢残す秋の暮れ

幾何数学研究センター
http://hirotaka-ebisui.com/

Alternative Collinear Theorem named as Rose-Dia

Hirotaka Ebisui

幾何数学研究センター　**ebisuihirotaka@io.ocn.ne.jp**

This Theorem is inscribed in a circle and has a rose Theorem（Fig 1 is Basic Red Rose Theorem） structure on two quadrilateral interpolated quadrilaterals on the diamond structue（Fig2 is one of Diamond Theorem） with four intersecting points. It is a theorem that the two intersection points are collinear with diagonal points of a perfect quadrangle of the bae quadrilateral. Fig 3. is an example of odd-even alternation theorem, and the rose stamen small square does not appear in the second,fourth,and sixth stages. Fig.4 shows the theorem of the interpolation or extrapolation structure where infinite alternation occurs inthe same structure with diffirent levels.

Keywords: Collinear Theorem,Alternative infinity chain,Rosetheorem,Diamond Sturucture

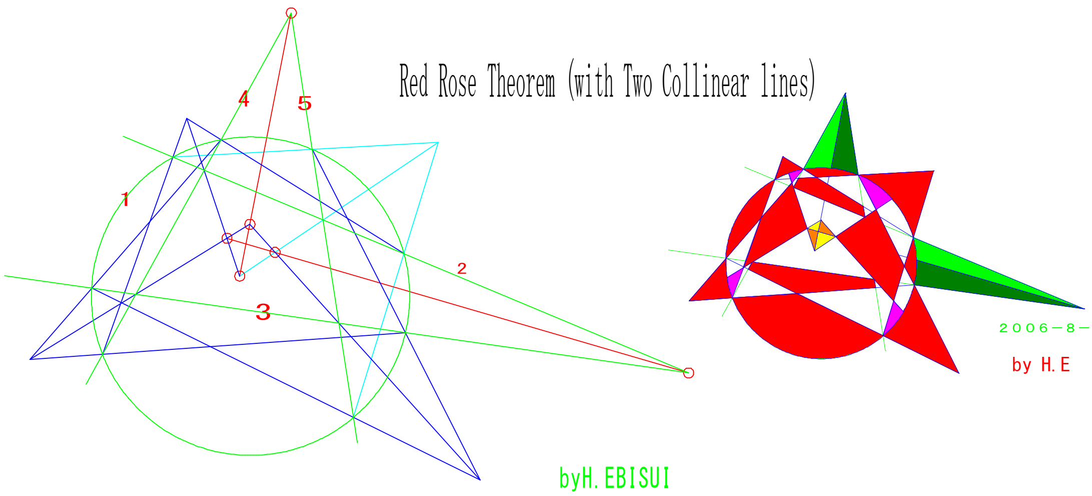


Fig 1. Red Rose Theorem

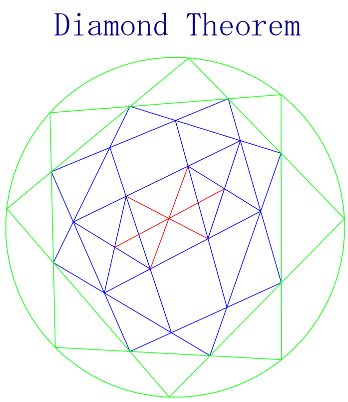


Fig 2 Diamon Theorem

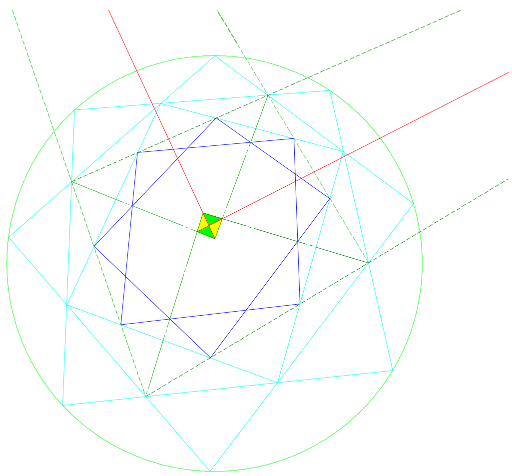


Fig 3 Rose-Dia Theorem

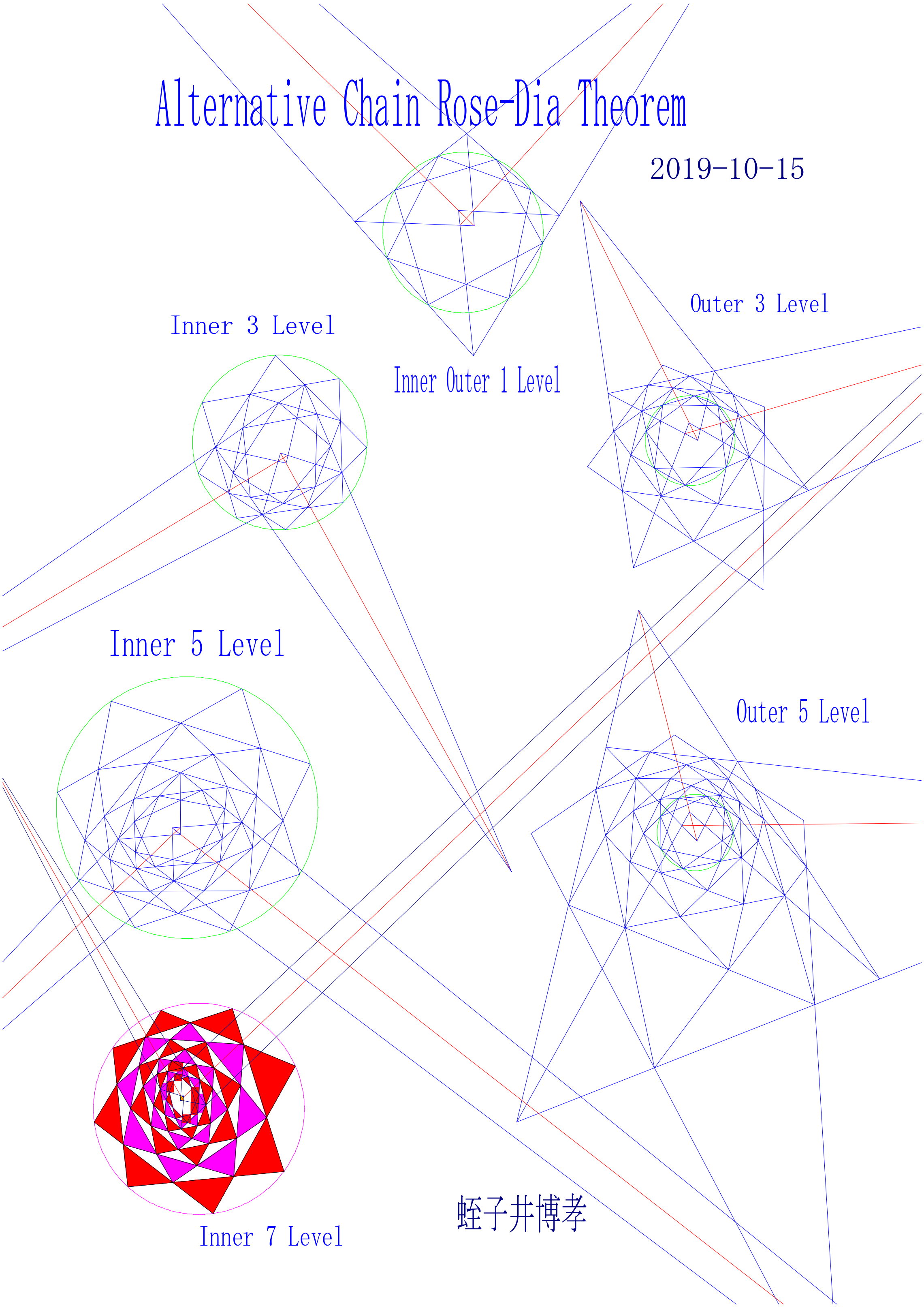
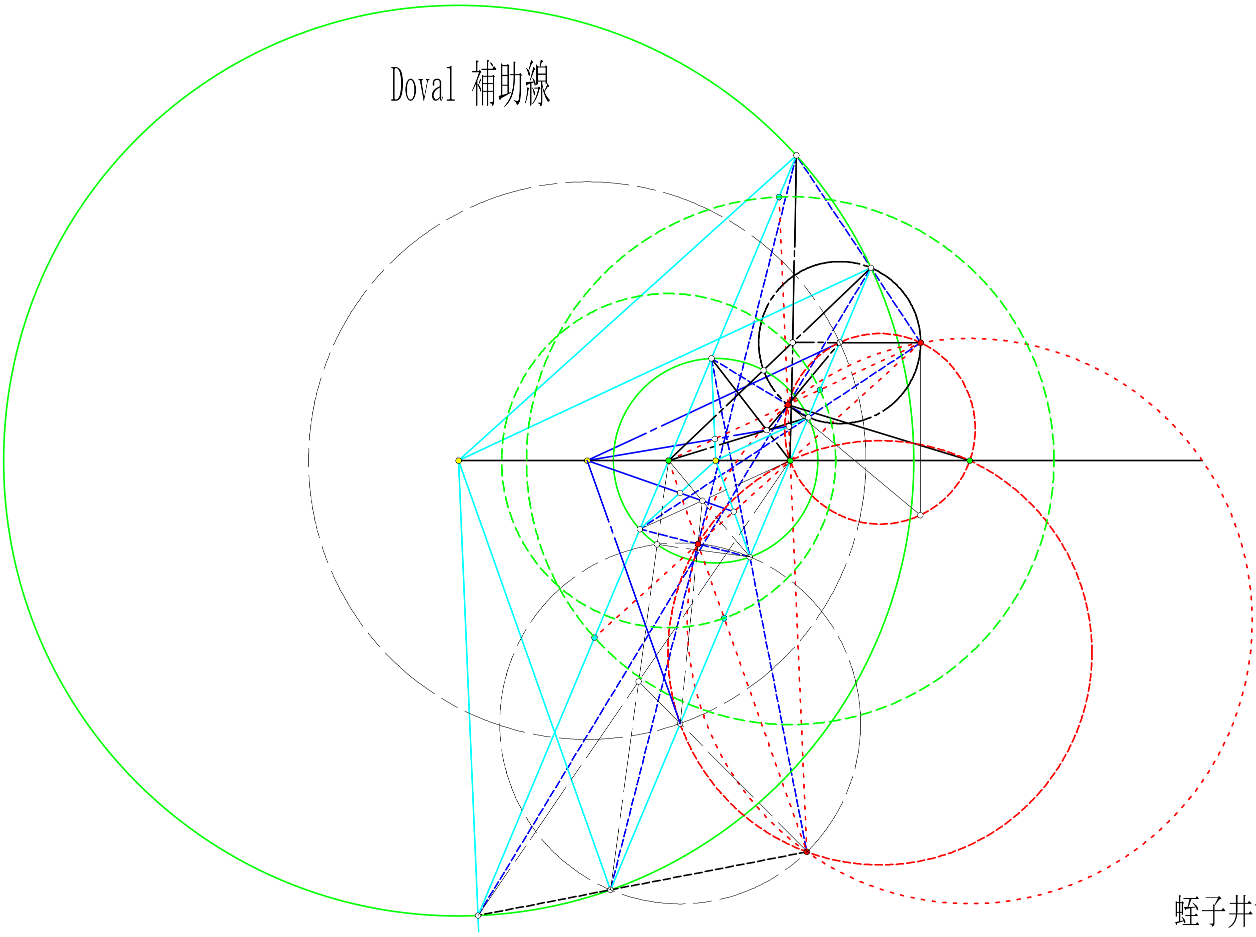


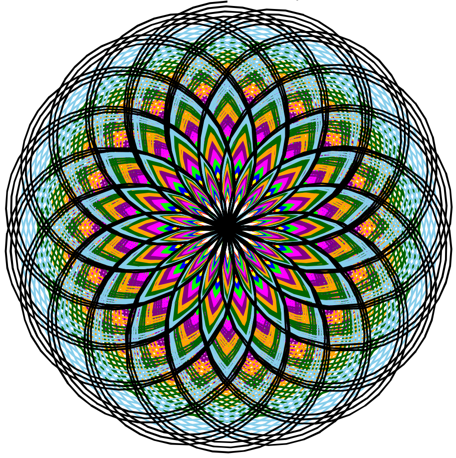
Fig.4 Alternative Collinear Rose-Dia Theorem Chains

Doval 補助線



蛭子井博孝

Pachikuri 漂涼花 by H.E



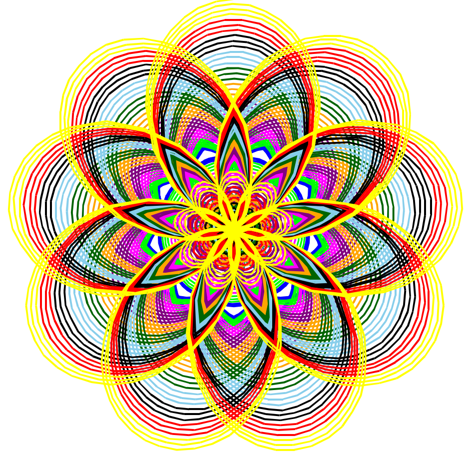
BGT = "11-11 (05:28:24 AM)", *HIC* = [35], *HEBB* = [8, 1, 1, 9]

$$X = \sin(248\,t)\cos(279\,t) + 8\sin(248\,t)\cos(279\,t)\cos\left(\tan\left(\cos\left(\frac{t}{t+11}\right)\right)\right)$$

$$Y = \cos(248\,t)\cos(279\,t) + 8\cos(248\,t)\cos(279\,t)\cos\left(\tan\left(\cos\left(\frac{t}{t+11}\right)\right)\right)$$

$\left[t = 0 ..2\,\pi,\ st = \frac{1}{10}\right]$, *蛭子井博孝*

Pachikuri 涼漂花 by H.E



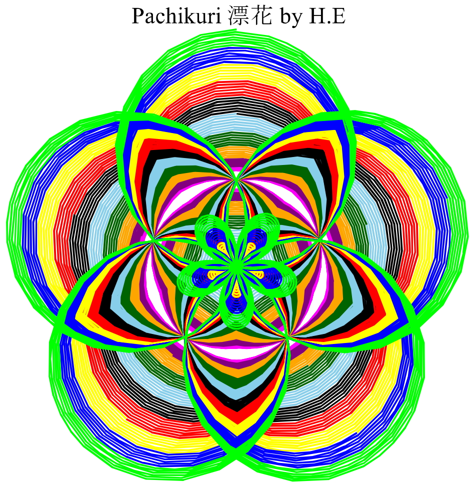
BGT = "11-11 (05:28:24 AM)", *HID* = [36], *HEBB* = [8, 1, 1, 9]

$$X = \sin(248\,t)\cos(279\,t) + 8\cos(279\,t)^2\sin(248\,t)\cos\left(\tan\left(\cos\left(\frac{t}{t+11}\right)\right)\right)$$

$$Y = \cos(248\,t)\cos(279\,t) + 8\cos(279\,t)^2\cos(248\,t)\cos\left(\tan\left(\cos\left(\frac{t}{t+11}\right)\right)\right)$$

$\left[t = 0 ..2\,\pi,\ st = \frac{1}{10}\right]$, *蛭子井博孝*

Pachikuri 漂花 by H.E



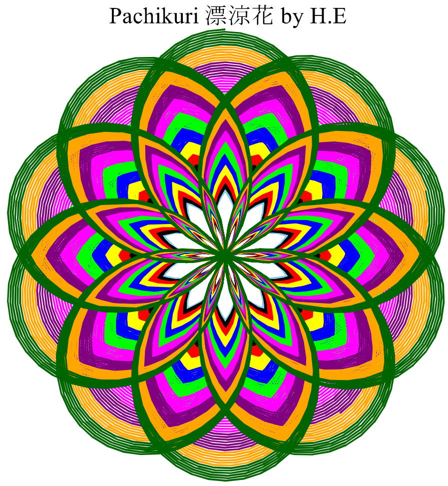
BGT = "11-11 (05:28:25 AM)", *HIA* = [37], *HEBB* = [8, 1, 1, 10]

$$X = \sin(248\,t) + 8\sin(248\,t)\cos(310\,t)\cos\left(\tan\left(\cos\left(\frac{t}{t+11}\right)\right)\right)$$

$$Y = \cos(248\,t) + 8\cos(248\,t)\cos(310\,t)\cos\left(\tan\left(\cos\left(\frac{t}{t+11}\right)\right)\right)$$

$\left[t = 0 ..2\,\pi,\ st = \frac{1}{10}\right]$, *蛭子井博孝*

Pachikuri 漂涼花 by H.E



BGT = "11-11 (05:28:26 AM)", *HIC* = [39], *HEBB* = [8, 1, 1, 10]

$$X = \sin(248\,t)\cos(310\,t) + 8\sin(248\,t)\cos(310\,t)\cos\left(\tan\left(\cos\left(\frac{t}{t+11}\right)\right)\right)$$

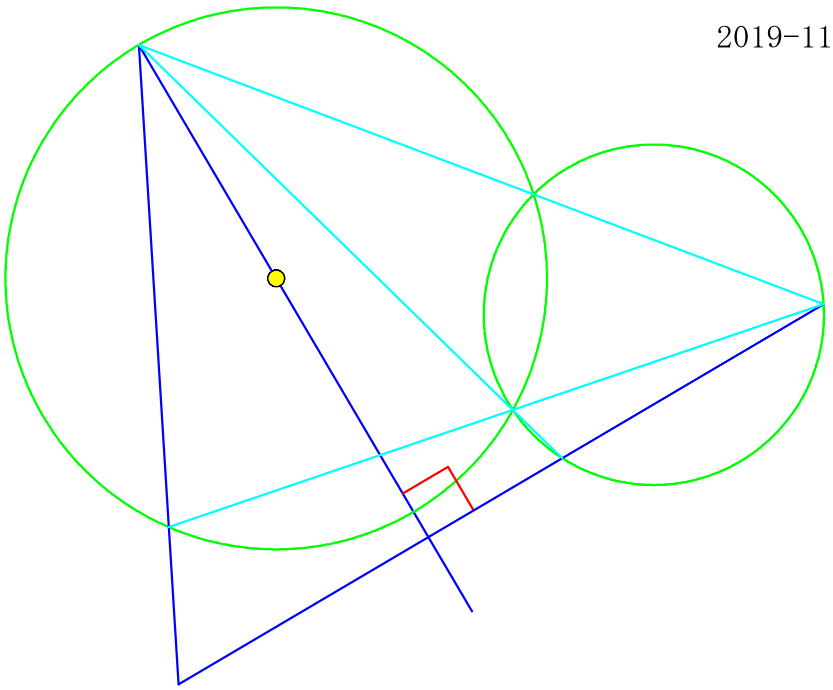
$$Y = \cos(248\,t)\cos(310\,t) + 8\cos(248\,t)\cos(310\,t)\cos\left(\tan\left(\cos\left(\frac{t}{t+11}\right)\right)\right)$$

$\left[t = 0 ..2\,\pi,\ st = \frac{1}{10}\right]$, *蛭子井博孝*

2円の交点を通る直線と円の交点よりできる直線の垂線中心線の定理

HE-GMN 69-1-1

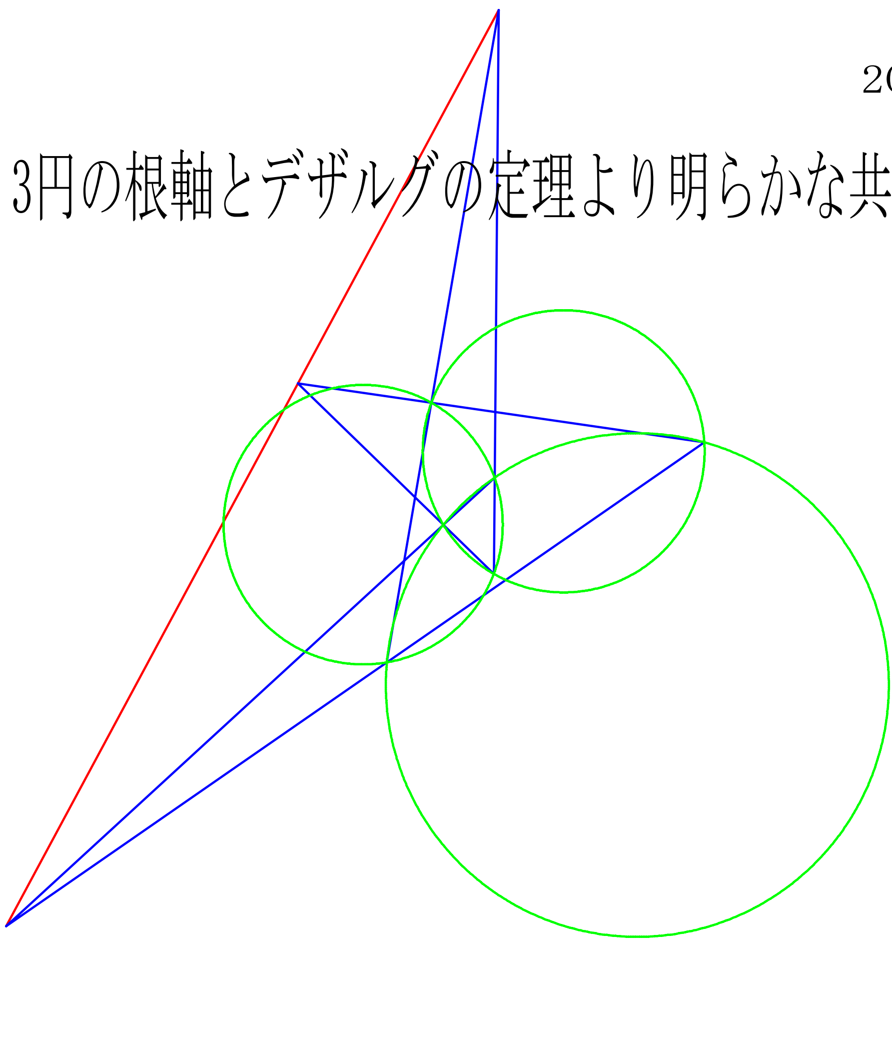
2019-11-2



2019-11-2

3円の根軸とデザルグの定理より明らかな共線定理

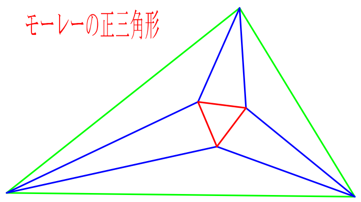
HE-GMN 69-1-2



蛭子井博孝

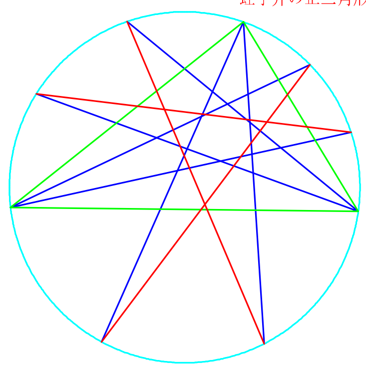
新正三角形

モーレーの正三角形



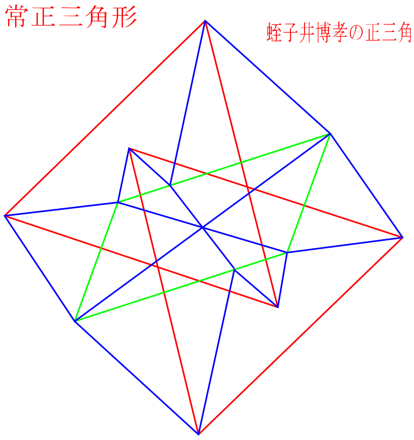
新新正三角形

蛭子井の正三角形

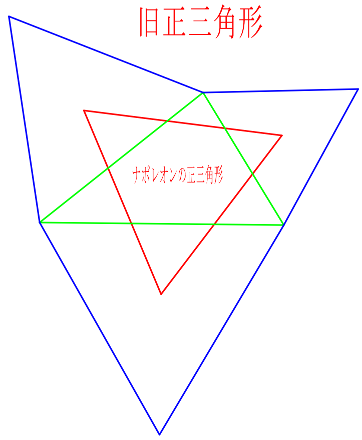


常正三角形

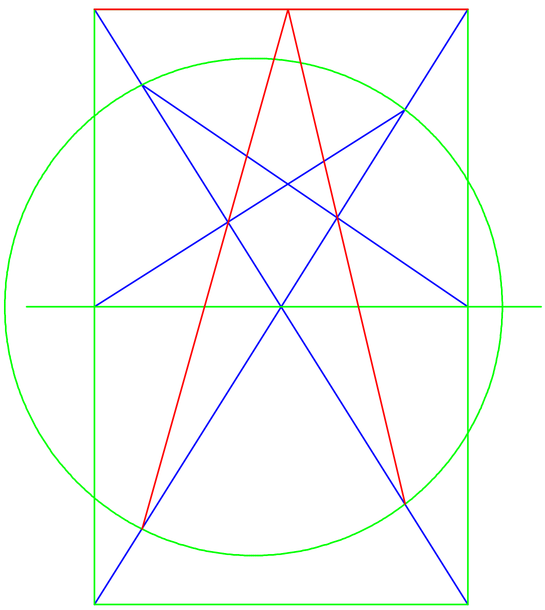
蛭子井博孝の正三角形



旧正三角形



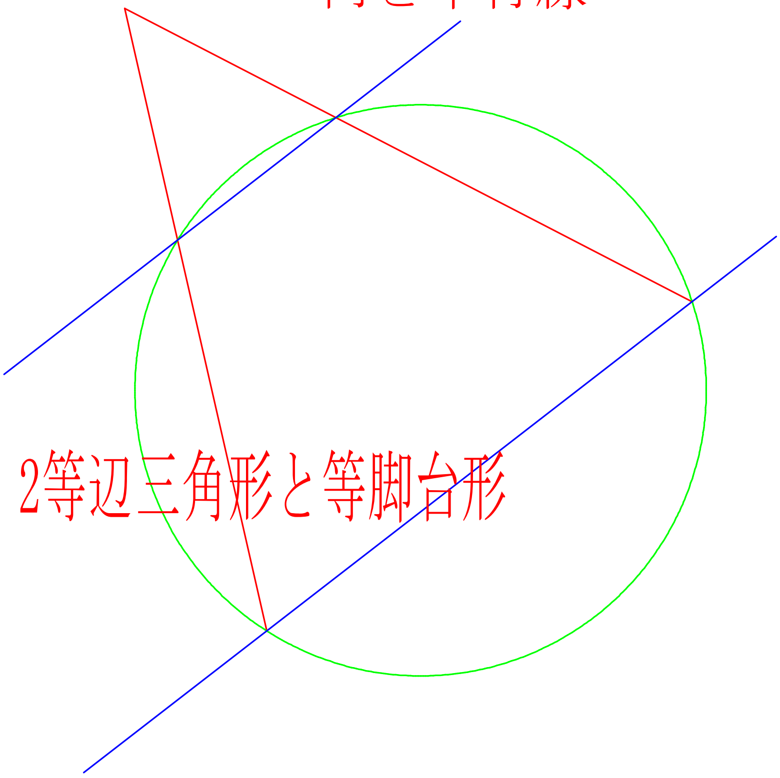
長方形と円の定理



蛭子井博孝

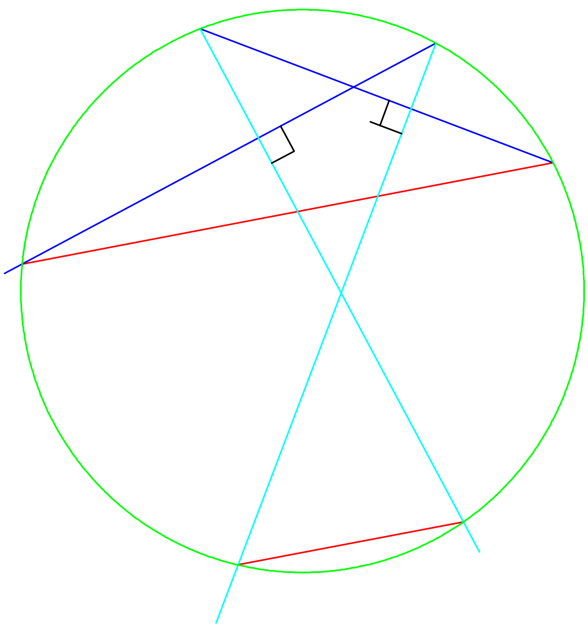
円と平行線

H.E-GMN-71-1



円と平行線　(垂直利用)

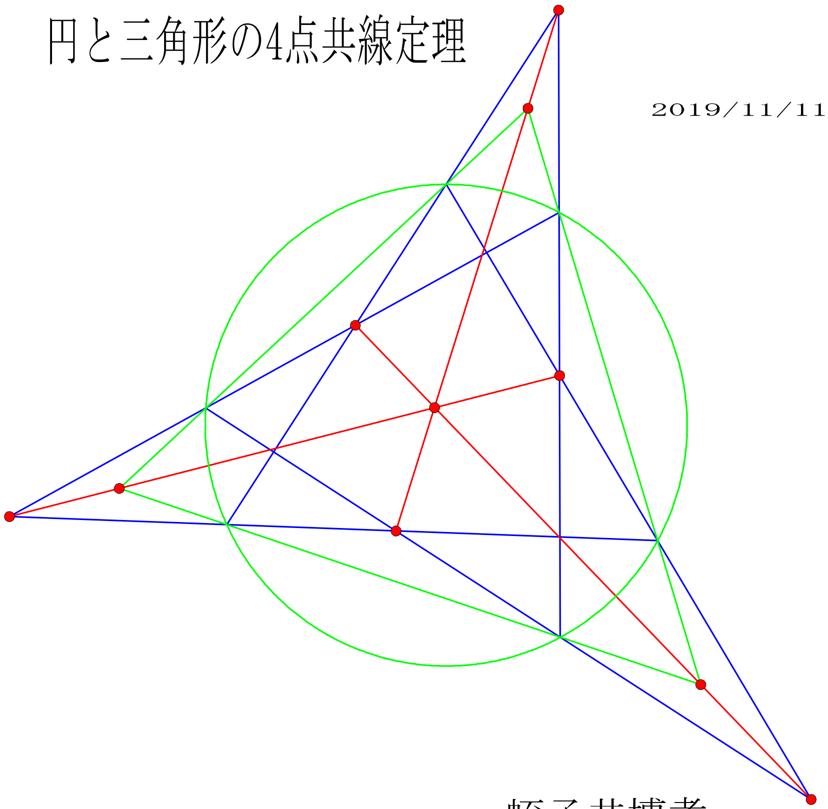
H.E-GMN-71-1-2



蛭子井博孝

円と三角形の4点共線定理

2019/11/11

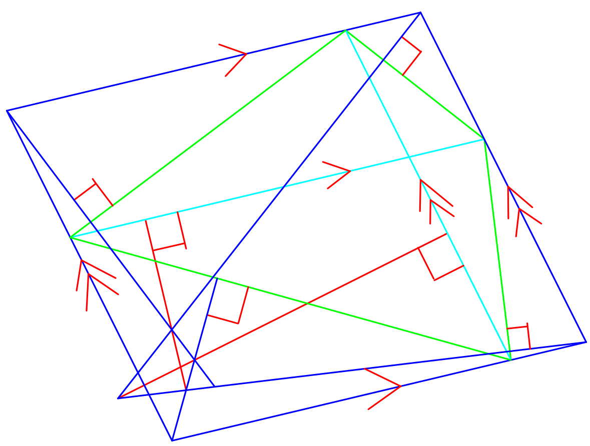


蛭子井博孝

4角形と平行線

4角形の対角線に平行な4角形の4垂線交点の垂直線定理

2019-11-16

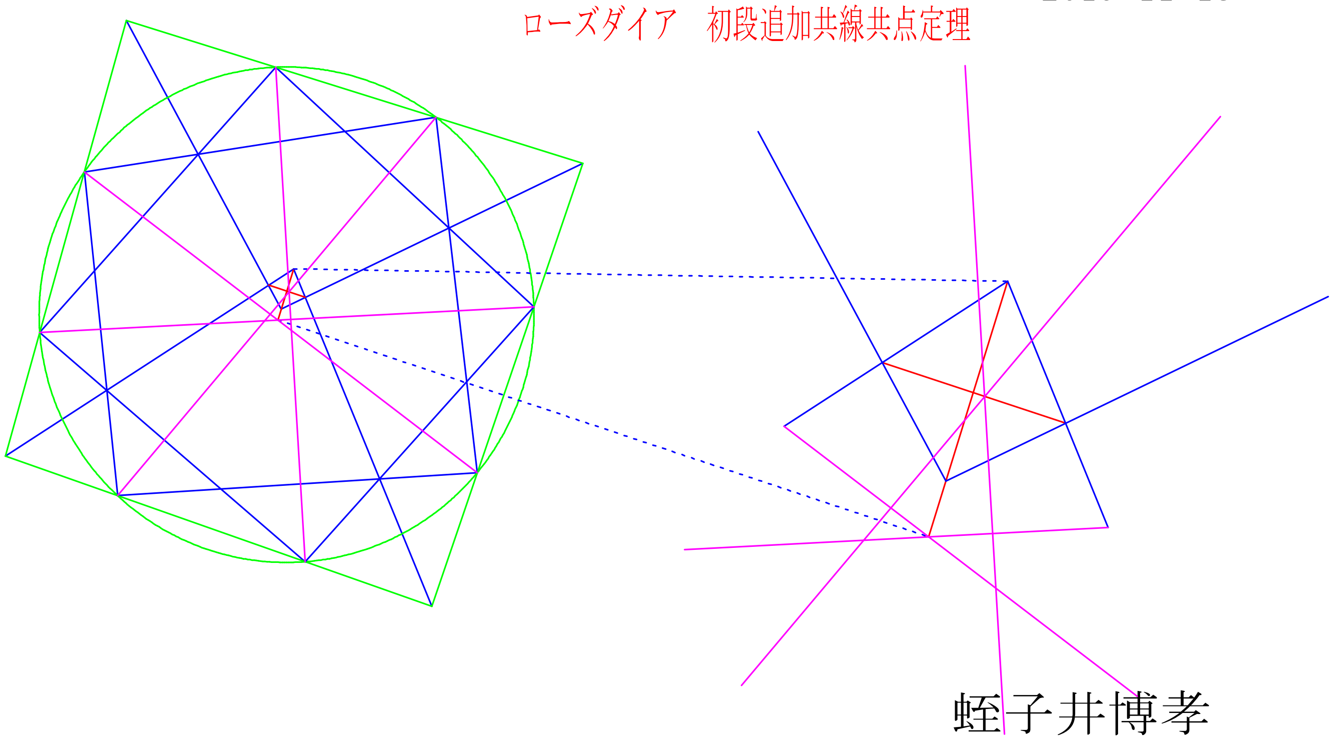


蛭子井博孝

円と四角形の定理

2019-11-15

ローズダイア　初段追加共線共点定理

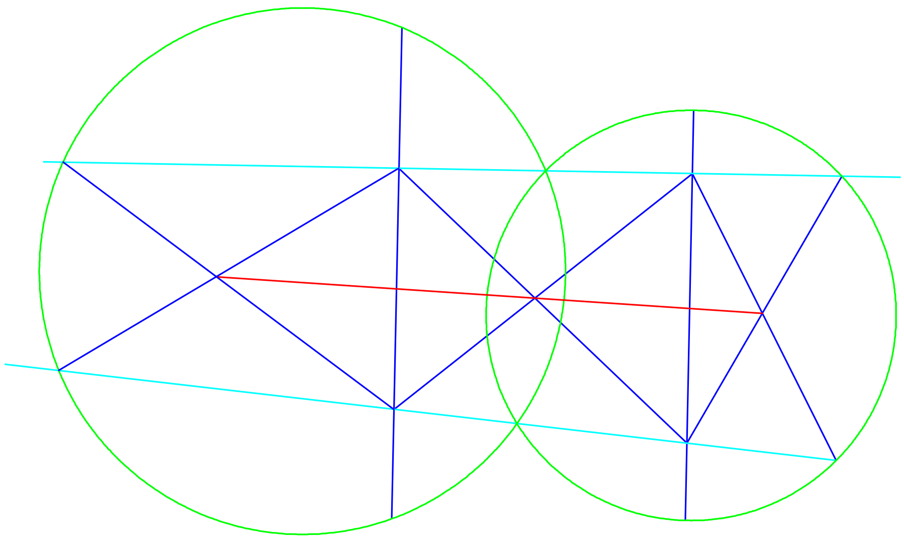


蛭子井博孝

隠し補助線を含む

2円ダイアの定理

H.E-GMN-72-1



蛭子井博孝

> # $ZETA\left(\frac{1}{2}+ZeTa0ee\cdot I\right) \le 10^{-8}$ **by** $H.E$:

>

> **for** h **from** $\frac{50}{100}$ **to** $\frac{50}{100}$ **do for** e **from** $14+\frac{13472}{100000}$ **to** $14+\frac{13473}{100000}$ **by** $\frac{1}{100000000}$

do $Z := evalf\left(\left(\mathrm{Re}(\zeta(h+e\cdot I))^2+\mathrm{Im}(\zeta(h+e\cdot I))^2\right)^{\frac{1}{2}}, 10\right)$ **:if** $Z < 10^{-8}$
then $print(ZeTa01[h+\{evalf(e, 10)\}\cdot I] = Z)$ **fi:od:od:**

$$ZeTa01_{\frac{1}{2}+I\{14.13472513\}} = 9.307494803\ 10^{-9}$$

$$ZeTa01_{\frac{1}{2}+I\{14.13472514\}} = 1.375890479\ 10^{-9}$$

$$ZeTa01_{\frac{1}{2}+I\{14.13472515\}} = 6.555713859\ 10^{-9} \quad (1)$$

> **for** h **from** $\frac{50}{100}$ **to** $\frac{50}{100}$ **do for** e **from** $21+\frac{22039}{1000000}$ **to** $21+\frac{22040}{1000000}$ **by** $\frac{1}{100000000}$

do $Z := evalf\left(\left(\mathrm{Re}(\zeta(h+e\cdot I))^2+\mathrm{Im}(\zeta(h+e\cdot I))^2\right)^{\frac{1}{2}}, 10\right)$ **:if** $Z < 10^{-8}$
then $print(ZeTa02[h+\{evalf(e, 10)\}\cdot I] = Z)$ **fi:od:od:**

$$ZeTa02_{\frac{1}{2}+I\{21.02203963\}} = 9.971846748\ 10^{-9}$$

$$ZeTa02_{\frac{1}{2}+I\{21.02203964\}} = 1.396544325\ 10^{-9} \quad (2)$$

>

$>$ #　完全数6，28，、、、by　H.E　2019 − 11 − 6 :

$>$ $c := 0$:**for** n **from** 2 **to** 10000000 **do** $s := 1$:**for** x **from** 2 **to** $\mathrm{floor}\left(evalf\left(n^{\frac{1}{2}}\right)\right)$ **do if** n **mod** $x = 0$ **then** $s := s + x + \frac{n}{x}$ **fi**: **od**:**if** s **mod** $n = 0$ **then if** $\frac{s}{n} = 1$ **then** $print(\ )$: $print($完全数、$H = n$, 約数の和$= s[ifactor(s)])$ **else** $print(\ )$: $print\left(\left\{\frac{s}{n}\right\}\right.$倍数, $H = n$, 約数の和$= s[ifactor(s)]\Big)$ **fi**:**fi**:**od**:

完全数、$H = 6$, 約数の和$= 6_{(2)\,(3)}$

完全数、$H = 28$, 約数の和$= 28_{(2)^2\,(7)}$

$\{2\}$ 倍数, $H = 120$, 約数の和$= 240_{(2)^4\,(3)\,(5)}$

完全数、$H = 496$, 約数の和$= 496_{(2)^4\,(31)}$

$\{2\}$ 倍数, $H = 672$, 約数の和$= 1344_{(2)^6\,(3)\,(7)}$

完全数、$H = 8128$, 約数の和$= 8128_{(2)^6\,(127)}$

$\{3\}$ 倍数, $H = 30240$, 約数の和$= 90720_{(2)^5\,(3)^4\,(5)\,(7)}$

$\{3\}$ 倍数, $H = 32760$, 約数の和$= 98280_{(2)^3\,(3)^3\,(5)\,(7)\,(13)}$

$\{2\}$ 倍数, $H = 523776$, 約数の和$= 1047552_{(2)^{10}\,(3)\,(11)\,(31)}$ **(1)**

$>$ **for** h **from** 2 **to** 10000 **do if** $isprime\left(\frac{h^h - 1}{h - 1}\right)$ **then** $print\left(\frac{[h]^h - 1}{[h] - 1} = prime(H \cdot E[h])\right)$ **fi**:**od**:

$$\frac{[2]^2 - 1}{[2] - 1} = prime(H \cdot E_2)$$

$$\frac{[3]^3 - 1}{[3] - 1} = prime(H \cdot E_3)$$

$$\frac{[19]^{19} - 1}{[19] - 1} = prime(H \cdot E_{19})$$

$$\frac{[31]^{31} - 1}{[31] - 1} = prime(H \cdot E_{31})$$

$$\frac{[7547]^{7547} - 1}{[7547] - 1} = prime(H \cdot E_{7547})$$ **(2)**

$>$

$>$

> $\# x^2 + y^2 + z^2 = 2019$ **by** $H \cdot E\ 2019 - 11 - 5$:

> $c := 0$: **for** x **from** 1 **to** 200 **do** $xp := x$:**for** y **from** x **to** 200 **do** $yp := y$: **for** z **from** y **to** 200 **do** $zp := z$: **if** $xp^2 + yp^2 + zp^2 = 2019$ **then** $c := c + 1$: $print(\ xp[。\ ]^2 + yp[。\ ]^2 + zp[。\ ]^2 = 2019\ 。\ 。\ 。\ No(c))$ **fi:od:od:od:**

$$1_{。}^{2} + 13_{。}^{2} + 43_{。}^{2} = 2019\ 。\ 。\ 。\ No(1)$$
$$5_{。}^{2} + 25_{。}^{2} + 37_{。}^{2} = 2019\ 。\ 。\ 。\ No(2)$$
$$7_{。}^{2} + 11_{。}^{2} + 43_{。}^{2} = 2019\ 。\ 。\ 。\ No(3)$$
$$7_{。}^{2} + 17_{。}^{2} + 41_{。}^{2} = 2019\ 。\ 。\ 。\ No(4)$$
$$11_{。}^{2} + 23_{。}^{2} + 37_{。}^{2} = 2019\ 。\ 。\ 。\ No(5)$$
$$2\ 13_{。}^{2} + 41_{。}^{2} = 2019\ 。\ 。\ 。\ No(6)$$
$$13_{。}^{2} + 25_{。}^{2} + 35_{。}^{2} = 2019\ 。\ 。\ 。\ No(7)$$
$$17_{。}^{2} + 19_{。}^{2} + 37_{。}^{2} = 2019\ 。\ 。\ 。\ No(8)$$
$$2\ 23_{。}^{2} + 31_{。}^{2} = 2019\ 。\ 。\ 。\ No(9) \qquad (1)$$

>

>

```
> # P psum=P by H.E 2019-11-1:
> c := 0 :for h from 1 to 100 do Hp := 0 :for e from h to h + ithprime(h) − 1 do Hp := Hp
    + ithprime(e) :od:if isprime(Hp) then c := c + 1 : print(ithprime(h)[{h} th p kara],
    ithprime(h + ithprime(h) − 1)[{h + ithprime(h) − 1} th p made],
    ithprime(h) ko primesum = Hp[prime[No[c]]]) fi :od:
```

$2_{\{1\}\ th\ p\ kara}, 3_{\{2\}\ th\ p\ made}, 2\ ko\ primesum = 5_{prime_{No_1}}$

$5_{\{3\}\ th\ p\ kara}, 17_{\{7\}\ th\ p\ made}, 5\ ko\ primesum = 53_{prime_{No_2}}$

$11_{\{5\}\ th\ p\ kara}, 47_{\{15\}\ th\ p\ made}, 11\ ko\ primesum = 311_{prime_{No_3}}$

$19_{\{8\}\ th\ p\ kara}, 101_{\{26\}\ th\ p\ made}, 19\ ko\ primesum = 1103_{prime_{No_4}}$

$29_{\{10\}\ th\ p\ kara}, 163_{\{38\}\ th\ p\ made}, 29\ ko\ primesum = 2647_{prime_{No_5}}$

$31_{\{11\}\ th\ p\ kara}, 179_{\{41\}\ th\ p\ made}, 31\ ko\ primesum = 3137_{prime_{No_6}}$

$67_{\{19\}\ th\ p\ kara}, 439_{\{85\}\ th\ p\ made}, 67\ ko\ primesum = 16339_{prime_{No_7}}$

$107_{\{28\}\ th\ p\ kara}, 757_{\{134\}\ th\ p\ made}, 107\ ko\ primesum = 44927_{prime_{No_8}}$

$109_{\{29\}\ th\ p\ kara}, 773_{\{137\}\ th\ p\ made}, 109\ ko\ primesum = 47123_{prime_{No_9}}$

$131_{\{32\}\ th\ p\ kara}, 953_{\{162\}\ th\ p\ made}, 131\ ko\ primesum = 68521_{prime_{No_{10}}}$

$211_{\{47\}\ th\ p\ kara}, 1621_{\{257\}\ th\ p\ made}, 211\ ko\ primesum = 189149_{prime_{No_{11}}}$

$277_{\{59\}\ th\ p\ kara}, 2251_{\{335\}\ th\ p\ made}, 277\ ko\ primesum = 337871_{prime_{No_{12}}}$

$367_{\{73\}\ th\ p\ kara}, 3067_{\{439\}\ th\ p\ made}, 367\ ko\ primesum = 609533_{prime_{No_{13}}}$

$383_{\{76\}\ th\ p\ kara}, 3251_{\{458\}\ th\ p\ made}, 383\ ko\ primesum = 668539_{prime_{No_{14}}}$

$503_{\{96\}\ th\ p\ kara}, 4391_{\{598\}\ th\ p\ made}, 503\ ko\ primesum = 1192753_{prime_{No_{15}}}$ **(1)**

```
>
```

> # P1·P2+P1+P2=Prime by H.E

```
> c := 0 :for h from 1 to 1000 do P3 := ithprime(h) + ithprime(h + 1) + ithprime(h)
    ·ithprime(h + 1) :if isprime(P3) then c := c + 1 : if c ≤ 100
    then print([ithprime(h)[{h} th p], ithprime(h + 1), P3[c]]) fi  fi:od:
```

$$[2_{\{1\}\ th\ p}, 3, 11_{1}]$$
$$[3_{\{2\}\ th\ p}, 5, 23_{2}]$$
$$[5_{\{3\}\ th\ p}, 7, 47_{3}]$$
$$[11_{\{5\}\ th\ p}, 13, 167_{4}]$$
$$[13_{\{6\}\ th\ p}, 17, 251_{5}]$$
$$[17_{\{7\}\ th\ p}, 19, 359_{6}]$$
$$[19_{\{8\}\ th\ p}, 23, 479_{7}]$$
$$[23_{\{9\}\ th\ p}, 29, 719_{8}]$$
$$[41_{\{13\}\ th\ p}, 43, 1847_{9}]$$
$$[43_{\{14\}\ th\ p}, 47, 2111_{10}]$$
$$[47_{\{15\}\ th\ p}, 53, 2591_{11}]$$
$$[59_{\{17\}\ th\ p}, 61, 3719_{12}]$$
$$[79_{\{22\}\ th\ p}, 83, 6719_{13}]$$
$$[83_{\{23\}\ th\ p}, 89, 7559_{14}]$$
$$[89_{\{24\}\ th\ p}, 97, 8819_{15}]$$
$$[101_{\{26\}\ th\ p}, 103, 10607_{16}]$$
$$[109_{\{29\}\ th\ p}, 113, 12539_{17}]$$
$$[113_{\{30\}\ th\ p}, 127, 14591_{18}]$$
$$[137_{\{33\}\ th\ p}, 139, 19319_{19}]$$
$$[163_{\{38\}\ th\ p}, 167, 27551_{20}]$$
$$[167_{\{39\}\ th\ p}, 173, 29231_{21}]$$
$$[173_{\{40\}\ th\ p}, 179, 31319_{22}]$$
$$[223_{\{48\}\ th\ p}, 227, 51071_{23}]$$
$$[229_{\{50\}\ th\ p}, 233, 53819_{24}]$$
$$[257_{\{55\}\ th\ p}, 263, 68111_{25}]$$
$$[311_{\{64\}\ th\ p}, 313, 97967_{26}]$$
$$[383_{\{76\}\ th\ p}, 389, 149759_{27}]$$
$$[389_{\{77\}\ th\ p}, 397, 155219_{28}]$$
$$[409_{\{80\}\ th\ p}, 419, 172199_{29}]$$
$$[419_{\{81\}\ th\ p}, 421, 177239_{30}]$$
$$[439_{\{85\}\ th\ p}, 443, 195359_{31}]$$
$$[443_{\{86\}\ th\ p}, 449, 199799_{32}]$$
$$[479_{\{92\}\ th\ p}, 487, 234239_{33}]$$
$$[521_{\{98\}\ th\ p}, 523, 273527_{34}]$$

$$\left[547_{\{101\}\ th\,p}, 557, 305783_{35}\right]$$
$$\left[557_{\{102\}\ th\,p}, 563, 314711_{36}\right]$$
$$\left[577_{\{106\}\ th\,p}, 587, 339863_{37}\right]$$
$$\left[593_{\{108\}\ th\,p}, 599, 356399_{38}\right]$$
$$\left[613_{\{112\}\ th\,p}, 617, 379451_{39}\right]$$
$$\left[643_{\{117\}\ th\,p}, 647, 417311_{40}\right]$$
$$\left[647_{\{118\}\ th\,p}, 653, 423791_{41}\right]$$
$$\left[683_{\{124\}\ th\,p}, 691, 473327_{42}\right]$$
$$\left[773_{\{137\}\ th\,p}, 787, 609911_{43}\right]$$
$$\left[797_{\{139\}\ th\,p}, 809, 646379_{44}\right]$$
$$\left[809_{\{140\}\ th\,p}, 811, 657719_{45}\right]$$
$$\left[811_{\{141\}\ th\,p}, 821, 667463_{46}\right]$$
$$\left[853_{\{147\}\ th\,p}, 857, 732731_{47}\right]$$
$$\left[953_{\{162\}\ th\,p}, 967, 923471_{48}\right]$$
$$\left[983_{\{166\}\ th\,p}, 991, 976127_{49}\right]$$
$$\left[1019_{\{171\}\ th\,p}, 1021, 1042439_{50}\right]$$
$$\left[1049_{\{176\}\ th\,p}, 1051, 1104599_{51}\right]$$
$$\left[1097_{\{184\}\ th\,p}, 1103, 1212191_{52}\right]$$
$$\left[1109_{\{186\}\ th\,p}, 1117, 1240979_{53}\right]$$
$$\left[1151_{\{190\}\ th\,p}, 1153, 1329407_{54}\right]$$
$$\left[1171_{\{193\}\ th\,p}, 1181, 1385303_{55}\right]$$
$$\left[1223_{\{200\}\ th\,p}, 1229, 1505519_{56}\right]$$
$$\left[1229_{\{201\}\ th\,p}, 1231, 1515359_{57}\right]$$
$$\left[1319_{\{215\}\ th\,p}, 1321, 1745039_{58}\right]$$
$$\left[1373_{\{220\}\ th\,p}, 1381, 1898867_{59}\right]$$
$$\left[1399_{\{222\}\ th\,p}, 1409, 1973999_{60}\right]$$
$$\left[1427_{\{225\}\ th\,p}, 1429, 2042039_{61}\right]$$
$$\left[1471_{\{233\}\ th\,p}, 1481, 2181503_{62}\right]$$
$$\left[1511_{\{240\}\ th\,p}, 1523, 2304287_{63}\right]$$
$$\left[1523_{\{241\}\ th\,p}, 1531, 2334767_{64}\right]$$
$$\left[1579_{\{249\}\ th\,p}, 1583, 2502719_{65}\right]$$
$$\left[1627_{\{258\}\ th\,p}, 1637, 2666663_{66}\right]$$
$$\left[1663_{\{261\}\ th\,p}, 1667, 2775551_{67}\right]$$
$$\left[1693_{\{264\}\ th\,p}, 1697, 2876411_{68}\right]$$
$$\left[1699_{\{266\}\ th\,p}, 1709, 2906999_{69}\right]$$
$$\left[1709_{\{267\}\ th\,p}, 1721, 2944619_{70}\right]$$

$$[1913_{\{293\}\ th\ p}, 1931, 3697847_{71}]$$
$$[1951_{\{297\}\ th\ p}, 1973, 3853247_{72}]$$
$$[1979_{\{299\}\ th\ p}, 1987, 3936239_{73}]$$
$$[1999_{\{303\}\ th\ p}, 2003, 4007999_{74}]$$
$$[2017_{\{306\}\ th\ p}, 2027, 4092503_{75}]$$
$$[2111_{\{318\}\ th\ p}, 2113, 4464767_{76}]$$
$$[2153_{\{325\}\ th\ p}, 2161, 4656947_{77}]$$
$$[2207_{\{329\}\ th\ p}, 2213, 4888511_{78}]$$
$$[2213_{\{330\}\ th\ p}, 2221, 4919507_{79}]$$
$$[2237_{\{332\}\ th\ p}, 2239, 5013119_{80}]$$
$$[2267_{\{336\}\ th\ p}, 2269, 5148359_{81}]$$
$$[2297_{\{342\}\ th\ p}, 2309, 5308379_{82}]$$
$$[2389_{\{355\}\ th\ p}, 2393, 5721659_{83}]$$
$$[2393_{\{356\}\ th\ p}, 2399, 5745599_{84}]$$
$$[2417_{\{359\}\ th\ p}, 2423, 5861231_{85}]$$
$$[2477_{\{367\}\ th\ p}, 2503, 6204911_{86}]$$
$$[2539_{\{371\}\ th\ p}, 2543, 6461759_{87}]$$
$$[2557_{\{375\}\ th\ p}, 2579, 6599639_{88}]$$
$$[2609_{\{379\}\ th\ p}, 2617, 6832979_{89}]$$
$$[2659_{\{385\}\ th\ p}, 2663, 7086239_{90}]$$
$$[2663_{\{386\}\ th\ p}, 2671, 7118207_{91}]$$
$$[2741_{\{400\}\ th\ p}, 2749, 7540499_{92}]$$
$$[2767_{\{403\}\ th\ p}, 2777, 7689503_{93}]$$
$$[2917_{\{422\}\ th\ p}, 2927, 8543903_{94}]$$
$$[2939_{\{424\}\ th\ p}, 2953, 8684759_{95}]$$
$$[2957_{\{426\}\ th\ p}, 2963, 8767511_{96}]$$
$$[2971_{\{429\}\ th\ p}, 2999, 8915999_{97}]$$
$$[3079_{\{440\}\ th\ p}, 3083, 9498719_{98}]$$
$$[3119_{\{444\}\ th\ p}, 3121, 9740639_{99}]$$
$$[3229_{\{457\}\ th\ p}, 3251, 10503959_{100}] \quad \textbf{(1)}$$

>

$$> \# \, sum \; x^{x} = Prime \; \textbf{by} \; H \cdot E \; 2019 - 11 - 9 :$$

$$> c := 0 : s := 0 : \textbf{for } h \textbf{ from } 1 \textbf{ to } 10000 \textbf{ do } s := s + h^{h} : \textbf{if } isprime(s) \textbf{ then } \textbf{ if } h \le 5 \textbf{ then } c := c + 1 : print\left(\sum_{j=1}^{h} [\, j \,]^{j} = Prime \; (H \cdot E[No = c]) \right) \textbf{ else } print\left([\,1\,]^{1} + [\,2\,]^{2} + [\,3\,]^{3} + xxx + [\,h - 1\,]^{h-1} + [\,h\,]^{h} = Prime(s) \, [H \cdot E[No = c]] \right) \textbf{ end if fi :od:}$$

$$[\,1\,] + [\,2\,]^{2} = Prime \; \left(H \cdot E_{No = 1}\right)$$

$$[\,1\,] + [\,2\,]^{2} + [\,3\,]^{3} + [\,4\,]^{4} + [\,5\,]^{5} = Prime \; \left(H \cdot E_{No = 2}\right)$$

$$[\,1\,] + [\,2\,]^{2} + [\,3\,]^{3} + xxx + [\,5\,]^{5} + [\,6\,]^{6} = Prime(50069)_{H \cdot E_{No = 2}}$$

$$[\,1\,] + [\,2\,]^{2} + [\,3\,]^{3} + xxx + [\,9\,]^{9} + [\,10\,]^{10} = Prime(10405071317)_{H \cdot E_{No = 2}}$$

$$[\,1\,] + [\,2\,]^{2} + [\,3\,]^{3} + xxx + [\,29\,]^{29} + [\,30\,]^{30} = Prime(208492413443704093346554910065262730566475781)_{H \cdot E_{No = 2}} \tag{1}$$

$$> \textbf{for } e \textbf{ from } 2 \textbf{ to } 6 \textbf{ do } print(\,) : c := 0 : s := 1 : \textbf{for } h \textbf{ from } 1 \textbf{ to } 200 \textbf{ do } s := s + ithprime(h)^{e} : \textbf{if } isprime(s) \textbf{ then } c := c + 1 : \textbf{if } h \le 5 \textbf{ then } print\left([\,1\,] + \sum_{j=1}^{h} ithprime(j) \; [\,\{j\} \; th \; p\,]^{e} = Prime \; (s) \, [H \cdot E[No = c]] \right) \textbf{ else } print\left(1^{e} + [\,[2][\,\{1\} \; th \; p\,]\,]^{e} + [\,[3][2 \; th \; p\,]\,]^{e} + xxx + [\,ithprime(h - 1) \, [\,(h - 1) \; th \; p\,]\,]^{e} + [\,ithprime(\, h) \, [\,h \; th \; p\,]\,]^{e} = Prime(s) \, [H \cdot E[No = c]] \right) \textbf{ end if fi :od:od:}$$

$$[\,1\,] + 2^{2}_{\{1\} \; th \; p} = Prime \; 5_{H \cdot E_{No = 1}}$$

$$1 + \left[[\,2\,]_{\{1\} \; th \; p}\right]^{2} + \left[[\,3\,]_{2 \; th \; p}\right]^{2} + xxx + \left[29_{10 \; th \; p}\right]^{2} + \left[31_{11 \; th \; p}\right]^{2} = Prime(3359)_{H \cdot E_{No = 2}}$$

$$1 + \left[[\,2\,]_{\{1\} \; th \; p}\right]^{2} + \left[[\,3\,]_{2 \; th \; p}\right]^{2} + xxx + \left[61_{18 \; th \; p}\right]^{2} + \left[67_{19 \; th \; p}\right]^{2} = Prime(24967)_{H \cdot E_{No = 3}}$$

$$1 + \left[[\,2\,]_{\{1\} \; th \; p}\right]^{2} + \left[[\,3\,]_{2 \; th \; p}\right]^{2} + xxx + \left[107_{28 \; th \; p}\right]^{2} + \left[109_{29 \; th \; p}\right]^{2} = Prime(109937)_{H \cdot E_{No = 4}}$$

$$1 + \left[[\,2\,]_{\{1\} \; th \; p}\right]^{2} + \left[[\,3\,]_{2 \; th \; p}\right]^{2} + xxx + \left[151_{36 \; th \; p}\right]^{2} + \left[157_{37 \; th \; p}\right]^{2} = Prime(263737)_{H \cdot E_{No = 5}}$$

$$1 + \left[[\,2\,]_{\{1\} \; th \; p}\right]^{2} + \left[[\,3\,]_{2 \; th \; p}\right]^{2} + xxx + \left[359_{72 \; th \; p}\right]^{2} + \left[367_{73 \; th \; p}\right]^{2} = Prime(2841373)_{H \cdot E_{No = 6}}$$

$$1 + \left[[\,2\,]_{\{1\} \; th \; p}\right]^{2} + \left[[\,3\,]_{2 \; th \; p}\right]^{2} + xxx + \left[503_{96 \; th \; p}\right]^{2} + \left[509_{97 \; th \; p}\right]^{2} = Prime(7547077)_{H \cdot E_{No = 7}}$$

$$1 + \left[[\,2\,]_{\{1\} \; th \; p}\right]^{2} + \left[[\,3\,]_{2 \; th \; p}\right]^{2} + xxx + \left[887_{154 \; th \; p}\right]^{2} + \left[907_{155 \; th \; p}\right]^{2} = Prime(37464551)_{H \cdot E_{No = 8}}$$

$$1+[[2]_{\{1\}\,th\,p}]^2+[[3]_{2\,th\,p}]^2+xxx+[953_{162\,th\,p}]^2+[967_{163\,th\,p}]^2 = Prime(44505631)_{H\cdot E_{No=9}}$$

$$1+[[2]_{\{1\}\,th\,p}]^2+[[3]_{2\,th\,p}]^2+xxx+[1033_{174\,th\,p}]^2+[1039_{175\,th\,p}]^2 = Prime(56680003)_{H\cdot E_{No=10}}$$

$$1+[[2]_{\{1\}\,th\,p}]^2+[[3]_{2\,th\,p}]^2+xxx+[1151_{190\,th\,p}]^2+[1153_{191\,th\,p}]^2 = Prime(75937523)_{H\cdot E_{No=11}}$$

$$1+[[2]_{\{1\}\,th\,p}]^3+[[3]_{2\,th\,p}]^3+xxx+[71_{20\,th\,p}]^3+[73_{21\,th\,p}]^3 = Prime(2013983)_{H\cdot E_{No=1}}$$

$$1+[[2]_{\{1\}\,th\,p}]^3+[[3]_{2\,th\,p}]^3+xxx+[997_{168\,th\,p}]^3+[1009_{169\,th\,p}]^3 = Prime(37528375567)_{H\cdot E_{No=2}}$$

$$1+[[2]_{\{1\}\,th\,p}]^3+[[3]_{2\,th\,p}]^3+xxx+[1061_{178\,th\,p}]^3+[1063_{179\,th\,p}]^3 = Prime(48720948259)_{H\cdot E_{No=3}}$$

$$[1]+2^4_{\{1\}\,th\,p} = Prime\ 17_{H\cdot E_{No=1}}$$

$$1+[[2]_{\{1\}\,th\,p}]^4+[[3]_{2\,th\,p}]^4+xxx+[37_{12\,th\,p}]^4+[41_{13\,th\,p}]^4 = Prime(6870733)_{H\cdot E_{No=2}}$$

$$1+[[2]_{\{1\}\,th\,p}]^4+[[3]_{2\,th\,p}]^4+xxx+[181_{42\,th\,p}]^4+[191_{43\,th\,p}]^4 = Prime(9723349723)_{H\cdot E_{No=3}}$$

$$1+[[2]_{\{1\}\,th\,p}]^4+[[3]_{2\,th\,p}]^4+xxx+[349_{70\,th\,p}]^4+[353_{71\,th\,p}]^4 = Prime(190977764951)_{H\cdot E_{No=4}}$$

$$1+[[2]_{\{1\}\,th\,p}]^4+[[3]_{2\,th\,p}]^4+xxx+[541_{100\,th\,p}]^4+[547_{101\,th\,p}]^4 = Prime(1503145202981)_{H\cdot E_{No=5}}$$

$$1+[[2]_{\{1\}\,th\,p}]^4+[[3]_{2\,th\,p}]^4+xxx+[857_{148\,th\,p}]^4+[859_{149\,th\,p}]^4 = Prime(14418852565829)_{H\cdot E_{No=6}}$$

$$1+[[2]_{\{1\}\,th\,p}]^4+[[3]_{2\,th\,p}]^4+xxx+[953_{162\,th\,p}]^4+[967_{163\,th\,p}]^4 = Prime(24276490010083)_{H\cdot E_{No=7}}$$

$$1+[[2]_{\{1\}\,th\,p}]^4+[[3]_{2\,th\,p}]^4+xxx+[1151_{190\,th\,p}]^4+[1153_{191\,th\,p}]^4 = Prime(59907449687471)_{H\cdot E_{No=8}}$$

$$1+[[2]_{\{1\}\,th\,p}]^5+[[3]_{2\,th\,p}]^5+xxx+[29_{10\,th\,p}]^5+[31_{11\,th\,p}]^5$$

$$= Prime(60025151)_{H \bullet E_{No=1}}$$

$$1 + \left[[2]_{\{1\}\,th\,p}\right]^5 + \left[[3]_{2\,th\,p}\right]^5 + xxx + \left[71_{20\,th\,p}\right]^5 + \left[73_{21\,th\,p}\right]^5 = Prime(7826720903)_{H \bullet E_{No=2}}$$

$$1 + \left[[2]_{\{1\}\,th\,p}\right]^5 + \left[[3]_{2\,th\,p}\right]^5 + xxx + \left[229_{50\,th\,p}\right]^5 + \left[233_{51\,th\,p}\right]^5 = Prime(5315694312101)_{H \bullet E_{No=3}}$$

$$1 + \left[[2]_{\{1\}\,th\,p}\right]^5 + \left[[3]_{2\,th\,p}\right]^5 + xxx + \left[503_{96\,th\,p}\right]^5 + \left[509_{97\,th\,p}\right]^5 = Prime(503388827998099)_{H \bullet E_{No=4}}$$

$$1 + \left[[2]_{\{1\}\,th\,p}\right]^5 + \left[[3]_{2\,th\,p}\right]^5 + xxx + \left[953_{162\,th\,p}\right]^5 + \left[967_{163\,th\,p}\right]^5 = Prime(19398671440091479)_{H \bullet E_{No=5}}$$

$$1 + \left[[2]_{\{1\}\,th\,p}\right]^5 + \left[[3]_{2\,th\,p}\right]^5 + xxx + \left[997_{168\,th\,p}\right]^5 + \left[1009_{169\,th\,p}\right]^5 = Prime(25056561870953887)_{H \bullet E_{No=6}}$$

$$1 + \left[[2]_{\{1\}\,th\,p}\right]^5 + \left[[3]_{2\,th\,p}\right]^5 + xxx + \left[1061_{178\,th\,p}\right]^5 + \left[1063_{179\,th\,p}\right]^5 = Prime(37137845945657467)_{H \bullet E_{No=7}}$$

$$1 + \left[[2]_{\{1\}\,th\,p}\right]^5 + \left[[3]_{2\,th\,p}\right]^5 + xxx + \left[1109_{186\,th\,p}\right]^5 + \left[1117_{187\,th\,p}\right]^5 = Prime(49794637822344073)_{H \bullet E_{No=8}}$$

$$1 + \left[[2]_{\{1\}\,th\,p}\right]^6 + \left[[3]_{2\,th\,p}\right]^6 + xxx + \left[181_{42\,th\,p}\right]^6 + \left[191_{43\,th\,p}\right]^6 = Prime(254637172916827)_{H \bullet E_{No=1}}$$

$$1 + \left[[2]_{\{1\}\,th\,p}\right]^6 + \left[[3]_{2\,th\,p}\right]^6 + xxx + \left[199_{46\,th\,p}\right]^6 + \left[211_{47\,th\,p}\right]^6 = Prime(515121222006767)_{H \bullet E_{No=2}}$$

$$1 + \left[[2]_{\{1\}\,th\,p}\right]^6 + \left[[3]_{2\,th\,p}\right]^6 + xxx + \left[421_{82\,th\,p}\right]^6 + \left[431_{83\,th\,p}\right]^6 = Prime(64165941996249827)_{H \bullet E_{No=3}}$$

$$1 + \left[[2]_{\{1\}\,th\,p}\right]^6 + \left[[3]_{2\,th\,p}\right]^6 + xxx + \left[1021_{172\,th\,p}\right]^6 + \left[1031_{173\,th\,p}\right]^6 = Prime(26101521510851697293)_{H \bullet E_{No=4}} \qquad \textbf{(2)}$$

> *lhs*(**(2)**)

$$1 + \left[[2]_{\{1\}\,th\,p}\right]^6 + \left[[3]_{2\,th\,p}\right]^6 + xxx + \left[1021_{172\,th\,p}\right]^6 + \left[1031_{173\,th\,p}\right]^6 \qquad \textbf{(3)}$$

>

> $\# x^2 + (x+1)^2 + (x+2)^2 + z^2 = y^2$ **by** $H \cdot E$ 2019 − 11 − 11 :

> $c := 0$: **for** h **from** 1 **to** 100000 **do for** x **from** 1 **to** 10 **do** $e := h^2 + (h+1)^2 + (h+2)^2 + x^2$:**if** $\mathrm{floor}\left(evalf\left(e^{\frac{1}{2}}\right)\right)^2 = e$ **then** $c := c+1$: $print\left([h]^2 + [h+1]^2 + [\ h+2]^2 + [x]^2 = \left[simplify\left(e^{\frac{1}{2}}\right)\right]^2 [No = c]\right)$ **fi** :**od**:**od**:

$$[4]^2 + [5]^2 + [6]^2 + [2]^2 = [9]^2\ [No = 1]$$
$$[18]^2 + [19]^2 + [20]^2 + [2]^2 = [33]^2\ [No = 2]$$
$$[70]^2 + [71]^2 + [72]^2 + [2]^2 = [123]^2\ [No = 3]$$
$$[264]^2 + [265]^2 + [266]^2 + [2]^2 = [459]^2\ [No = 4]$$
$$[988]^2 + [989]^2 + [990]^2 + [2]^2 = [1713]^2\ [No = 5]$$
$$[3690]^2 + [3691]^2 + [3692]^2 + [2]^2 = [6393]^2\ [No = 6]$$
$$[13774]^2 + [13775]^2 + [13776]^2 + [2]^2 = [23859]^2\ [No = 7]$$
$$[51408]^2 + [51409]^2 + [51410]^2 + [2]^2 = [89043]^2\ [No = 8] \quad (1)$$

>

> $\# X^3 = y^2 + z^2, x^3 = y^3 + z^3 + w^3$ **by** $H \bullet E$ 2019 − 11 − 15 :

> $c := 0$: **for** x **from** 1 **to** 100 **do for** y **from** 1 **to** 1000 **do for** z **from** y **to** 1000 **do if** $x^3 = y^2 + z^2$ **then** $c := c + 1$: $print\left([x[_\circ\ ]^3 = y[_\circ\ ]^2 + z[_\circ\ _\circ\ ]^2][H \bullet E[No = c]] \right)$ **fi**:**od**:**od**:**od**:

$$[2^3_\circ = 2^2_\circ + 2^2_{\circ\ \circ}]_{H \bullet E_{No=1}}$$

$$[5^3_\circ = 2^2_\circ + 11^2_{\circ\ \circ}]_{H \bullet E_{No=2}}$$

$$[5^3_\circ = 5^2_\circ + 10^2_{\circ\ \circ}]_{H \bullet E_{No=3}}$$

$$[8^3_\circ = 16^2_\circ + 16^2_{\circ\ \circ}]_{H \bullet E_{No=4}}$$

$$[10^3_\circ = 10^2_\circ + 30^2_{\circ\ \circ}]_{H \bullet E_{No=5}}$$

$$[10^3_\circ = 18^2_\circ + 26^2_{\circ\ \circ}]_{H \bullet E_{No=6}}$$

$$[13^3_\circ = 9^2_\circ + 46^2_{\circ\ \circ}]_{H \bullet E_{No=7}}$$

$$[13^3_\circ = 26^2_\circ + 39^2_{\circ\ \circ}]_{H \bullet E_{No=8}}$$

$$[17^3_\circ = 17^2_\circ + 68^2_{\circ\ \circ}]_{H \bullet E_{No=9}}$$

$$[17^3_\circ = 47^2_\circ + 52^2_{\circ\ \circ}]_{H \bullet E_{No=10}}$$

$$[18^3_\circ = 54^2_\circ + 54^2_{\circ\ \circ}]_{H \bullet E_{No=11}}$$

$$[20^3_\circ = 16^2_\circ + 88^2_{\circ\ \circ}]_{H \bullet E_{No=12}}$$

$$[20^3_\circ = 40^2_\circ + 80^2_{\circ\ \circ}]_{H \bullet E_{No=13}}$$

$$[25^3_\circ = 35^2_\circ + 120^2_{\circ\ \circ}]_{H \bullet E_{No=14}}$$

$$[25^3_\circ = 44^2_\circ + 117^2_{\circ\ \circ}]_{H \bullet E_{No=15}}$$

$$[25^3_\circ = 75^2_\circ + 100^2_{\circ\ \circ}]_{H \bullet E_{No=16}}$$

$$[26^3_\circ = 26^2_\circ + 130^2_{\circ\ \circ}]_{H \bullet E_{No=17}}$$

$$[26^3_\circ = 74^2_\circ + 110^2_{\circ\ \circ}]_{H \bullet E_{No=18}}$$

$$[29^3_\circ = 58^2_\circ + 145^2_{\circ\ \circ}]_{H \bullet E_{No=19}}$$

$$[29^3_\circ = 65^2_\circ + 142^2_{\circ\ \circ}]_{H \bullet E_{No=20}}$$

$$[32^3_\circ = 128^2_\circ + 128^2_{\circ\ \circ}]_{H \bullet E_{No=21}}$$

$$\left[34^3_{\circ} = 10^2_{\circ} + 198^2_{\circ}\ \circ\ \right]_{H\bullet E_{No=22}}$$

$$\left[34^3_{\circ} = 102^2_{\circ} + 170^2_{\circ}\ \circ\ \right]_{H\bullet E_{No=23}}$$

$$\left[37^3_{\circ} = 37^2_{\circ} + 222^2_{\circ}\ \circ\ \right]_{H\bullet E_{No=24}}$$

$$\left[37^3_{\circ} = 107^2_{\circ} + 198^2_{\circ}\ \circ\ \right]_{H\bullet E_{No=25}}$$

$$\left[40^3_{\circ} = 80^2_{\circ} + 240^2_{\circ}\ \circ\ \right]_{H\bullet E_{No=26}}$$

$$\left[40^3_{\circ} = 144^2_{\circ} + 208^2_{\circ}\ \circ\ \right]_{H\bullet E_{No=27}}$$

$$\left[41^3_{\circ} = 115^2_{\circ} + 236^2_{\circ}\ \circ\ \right]_{H\bullet E_{No=28}}$$

$$\left[41^3_{\circ} = 164^2_{\circ} + 205^2_{\circ}\ \circ\ \right]_{H\bullet E_{No=29}}$$

$$\left[45^3_{\circ} = 54^2_{\circ} + 297^2_{\circ}\ \circ\ \right]_{H\bullet E_{No=30}}$$

$$\left[45^3_{\circ} = 135^2_{\circ} + 270^2_{\circ}\ \circ\ \right]_{H\bullet E_{No=31}}$$

$$\left[50^3_{\circ} = 50^2_{\circ} + 350^2_{\circ}\ \circ\ \right]_{H\bullet E_{No=32}}$$

$$\left[50^3_{\circ} = 146^2_{\circ} + 322^2_{\circ}\ \circ\ \right]_{H\bullet E_{No=33}}$$

$$\left[50^3_{\circ} = 170^2_{\circ} + 310^2_{\circ}\ \circ\ \right]_{H\bullet E_{No=34}}$$

$$\left[50^3_{\circ} = 250^2_{\circ} + 250^2_{\circ}\ \circ\ \right]_{H\bullet E_{No=35}}$$

$$\left[52^3_{\circ} = 72^2_{\circ} + 368^2_{\circ}\ \circ\ \right]_{H\bullet E_{No=36}}$$

$$\left[52^3_{\circ} = 208^2_{\circ} + 312^2_{\circ}\ \circ\ \right]_{H\bullet E_{No=37}}$$

$$\left[53^3_{\circ} = 106^2_{\circ} + 371^2_{\circ}\ \circ\ \right]_{H\bullet E_{No=38}}$$

$$\left[53^3_{\circ} = 259^2_{\circ} + 286^2_{\circ}\ \circ\ \right]_{H\bullet E_{No=39}}$$

$$\left[58^3_{\circ} = 154^2_{\circ} + 414^2_{\circ}\ \circ\ \right]_{H\bullet E_{No=40}}$$

$$\left[58^3_{\circ} = 174^2_{\circ} + 406^2_{\circ}\ \circ\ \right]_{H\bullet E_{No=41}}$$

$$\left[61^3_{\circ} = 234^2_{\circ} + 415^2_{\circ}\ \circ\ \right]_{H\bullet E_{No=42}}$$

$$\left[61^3_{\circ} = 305^2_{\circ} + 366^2_{\circ}\ \circ\ \right]_{H\bullet E_{No=43}}$$

$$\left[65^3_{\circ} = 7^2_{\circ} + 524^2_{\circ}\ \circ\ \right]_{H\bullet E_{No=44}}$$

$$\left[65^{3}_{\circ} = 65^{2}_{\circ} + 520^{2}_{\circ}\ {}_{\circ}\right]_{H \bullet E_{No=45}}$$

$$\left[65^{3}_{\circ} = 140^{2}_{\circ} + 505^{2}_{\circ}\ {}_{\circ}\right]_{H \bullet E_{No=46}}$$

$$\left[65^{3}_{\circ} = 191^{2}_{\circ} + 488^{2}_{\circ}\ {}_{\circ}\right]_{H \bullet E_{No=47}}$$

$$\left[65^{3}_{\circ} = 208^{2}_{\circ} + 481^{2}_{\circ}\ {}_{\circ}\right]_{H \bullet E_{No=48}}$$

$$\left[65^{3}_{\circ} = 260^{2}_{\circ} + 455^{2}_{\circ}\ {}_{\circ}\right]_{H \bullet E_{No=49}}$$

$$\left[65^{3}_{\circ} = 320^{2}_{\circ} + 415^{2}_{\circ}\ {}_{\circ}\right]_{H \bullet E_{No=50}}$$

$$\left[65^{3}_{\circ} = 364^{2}_{\circ} + 377^{2}_{\circ}\ {}_{\circ}\right]_{H \bullet E_{No=51}}$$

$$\left[68^{3}_{\circ} = 136^{2}_{\circ} + 544^{2}_{\circ}\ {}_{\circ}\right]_{H \bullet E_{No=52}}$$

$$\left[68^{3}_{\circ} = 376^{2}_{\circ} + 416^{2}_{\circ}\ {}_{\circ}\right]_{H \bullet E_{No=53}}$$

$$\left[72^{3}_{\circ} = 432^{2}_{\circ} + 432^{2}_{\circ}\ {}_{\circ}\right]_{H \bullet E_{No=54}}$$

$$\left[73^{3}_{\circ} = 219^{2}_{\circ} + 584^{2}_{\circ}\ {}_{\circ}\right]_{H \bullet E_{No=55}}$$

$$\left[73^{3}_{\circ} = 296^{2}_{\circ} + 549^{2}_{\circ}\ {}_{\circ}\right]_{H \bullet E_{No=56}}$$

$$\left[74^{3}_{\circ} = 182^{2}_{\circ} + 610^{2}_{\circ}\ {}_{\circ}\right]_{H \bullet E_{No=57}}$$

$$\left[74^{3}_{\circ} = 370^{2}_{\circ} + 518^{2}_{\circ}\ {}_{\circ}\right]_{H \bullet E_{No=58}}$$

$$\left[80^{3}_{\circ} = 128^{2}_{\circ} + 704^{2}_{\circ}\ {}_{\circ}\right]_{H \bullet E_{No=59}}$$

$$\left[80^{3}_{\circ} = 320^{2}_{\circ} + 640^{2}_{\circ}\ {}_{\circ}\right]_{H \bullet E_{No=60}}$$

$$\left[82^{3}_{\circ} = 82^{2}_{\circ} + 738^{2}_{\circ}\ {}_{\circ}\right]_{H \bullet E_{No=61}}$$

$$\left[82^{3}_{\circ} = 242^{2}_{\circ} + 702^{2}_{\circ}\ {}_{\circ}\right]_{H \bullet E_{No=62}}$$

$$\left[85^{3}_{\circ} = 51^{2}_{\circ} + 782^{2}_{\circ}\ {}_{\circ}\right]_{H \bullet E_{No=63}}$$

$$\left[85^{3}_{\circ} = 170^{2}_{\circ} + 765^{2}_{\circ}\ {}_{\circ}\right]_{H \bullet E_{No=64}}$$

$$\left[85^{3}_{\circ} = 210^{2}_{\circ} + 755^{2}_{\circ}\ {}_{\circ}\right]_{H \bullet E_{No=65}}$$

$$\left[85^{3}_{\circ} = 285^{2}_{\circ} + 730^{2}_{\circ}\ {}_{\circ}\right]_{H \bullet E_{No=66}}$$

$$\left[85^{3}_{\circ} = 323^{2}_{\circ} + 714^{2}_{\circ}\ {}_{\circ}\right]_{H \bullet E_{No=67}}$$

$$\left[85^3_{\circ} = 413^2_{\circ} + 666^2_{\circ\ \circ}\right]_{H \cdot E_{No=68}}$$

$$\left[85^3_{\circ} = 478^2_{\circ} + 621^2_{\circ\ \circ}\right]_{H \cdot E_{No=69}}$$

$$\left[85^3_{\circ} = 510^2_{\circ} + 595^2_{\circ\ \circ}\right]_{H \cdot E_{No=70}}$$

$$\left[89^3_{\circ} = 88^2_{\circ} + 835^2_{\circ\ \circ}\right]_{H \cdot E_{No=71}}$$

$$\left[89^3_{\circ} = 445^2_{\circ} + 712^2_{\circ\ \circ}\right]_{H \cdot E_{No=72}}$$

$$\left[90^3_{\circ} = 270^2_{\circ} + 810^2_{\circ\ \circ}\right]_{H \cdot E_{No=73}}$$

$$\left[90^3_{\circ} = 486^2_{\circ} + 702^2_{\circ\ \circ}\right]_{H \cdot E_{No=74}}$$

$$\left[97^3_{\circ} = 297^2_{\circ} + 908^2_{\circ\ \circ}\right]_{H \cdot E_{No=75}}$$

$$\left[97^3_{\circ} = 388^2_{\circ} + 873^2_{\circ\ \circ}\right]_{H \cdot E_{No=76}}$$

$$\left[98^3_{\circ} = 686^2_{\circ} + 686^2_{\circ\ \circ}\right]_{H \cdot E_{No=77}}$$

$$\left[100^3_{\circ} = 280^2_{\circ} + 960^2_{\circ\ \circ}\right]_{H \cdot E_{No=78}}$$

$$\left[100^3_{\circ} = 352^2_{\circ} + 936^2_{\circ\ \circ}\right]_{H \cdot E_{No=79}}$$

$$\left[100^3_{\circ} = 600^2_{\circ} + 800^2_{\circ\ \circ}\right]_{H \cdot E_{No=80}} \quad \textbf{(1)}$$

> $c := 0$: **for** x **from** 1 **to** 100 **do for** y **from** 1 **to** 100 **do for** z **from** y **to** 100 **do for** w **from** z **to** 100 **do if** $x^3 = y^3 + z^3 + w^3$ **then** $c := c + 1$: $print\left(\left[x[\circ]^3 = y[\circ]^3 + z[\circ\ \circ]^3 + w[\circ\ \circ\ \circ]^3\right][H \cdot E[No = c]]\right)$ **fi:od:od:od:od:**

$$\left[6^3_{\circ} = 3^3_{\circ} + 4^3_{\circ\ \circ} + 5^3_{\circ\ \circ\ \circ}\right]_{H \cdot E_{No=1}}$$

$$\left[9^3_{\circ} = 1^3_{\circ} + 6^3_{\circ\ \circ} + 8^3_{\circ\ \circ\ \circ}\right]_{H \cdot E_{No=2}}$$

$$\left[12^3_{\circ} = 6^3_{\circ} + 8^3_{\circ\ \circ} + 10^3_{\circ\ \circ\ \circ}\right]_{H \cdot E_{No=3}}$$

$$\left[18^3_{\circ} = 2^3_{\circ} + 12^3_{\circ\ \circ} + 16^3_{\circ\ \circ\ \circ}\right]_{H \cdot E_{No=4}}$$

$$\left[18^3_{\circ} = 9^3_{\circ} + 12^3_{\circ\ \circ} + 15^3_{\circ\ \circ\ \circ}\right]_{H \cdot E_{No=5}}$$

$$\left[19^3_{\circ} = 3^3_{\circ} + 10^3_{\circ\ \circ} + 18^3_{\circ\ \circ\ \circ}\right]_{H \cdot E_{No=6}}$$

$$\left[20^3_{\circ} = 7^3_{\circ} + 14^3_{\circ\ \circ} + 17^3_{\circ\ \circ\ \circ}\right]_{H \cdot E_{No=7}}$$

$$\left[24^3_{\circ} = 12^3_{\circ} + 16^3_{\circ\ \circ} + 20^3_{\circ\ \circ\ \circ}\right]_{H \cdot E_{No=8}}$$

$$\left[25^3_{\circ} = 4^3_{\circ} + 17^3_{\circ\,\circ} + 22^3_{\circ\,\circ\,\circ}\right]_{H \bullet E_{No=9}}$$

$$\left[27^3_{\circ} = 3^3_{\circ} + 18^3_{\circ\,\circ} + 24^3_{\circ\,\circ\,\circ}\right]_{H \bullet E_{No=10}}$$

$$\left[28^3_{\circ} = 18^3_{\circ} + 19^3_{\circ\,\circ} + 21^3_{\circ\,\circ\,\circ}\right]_{H \bullet E_{No=11}}$$

$$\left[29^3_{\circ} = 11^3_{\circ} + 15^3_{\circ\,\circ} + 27^3_{\circ\,\circ\,\circ}\right]_{H \bullet E_{No=12}}$$

$$\left[30^3_{\circ} = 15^3_{\circ} + 20^3_{\circ\,\circ} + 25^3_{\circ\,\circ\,\circ}\right]_{H \bullet E_{No=13}}$$

$$\left[36^3_{\circ} = 4^3_{\circ} + 24^3_{\circ\,\circ} + 32^3_{\circ\,\circ\,\circ}\right]_{H \bullet E_{No=14}}$$

$$\left[36^3_{\circ} = 18^3_{\circ} + 24^3_{\circ\,\circ} + 30^3_{\circ\,\circ\,\circ}\right]_{H \bullet E_{No=15}}$$

$$\left[38^3_{\circ} = 6^3_{\circ} + 20^3_{\circ\,\circ} + 36^3_{\circ\,\circ\,\circ}\right]_{H \bullet E_{No=16}}$$

$$\left[40^3_{\circ} = 14^3_{\circ} + 28^3_{\circ\,\circ} + 34^3_{\circ\,\circ\,\circ}\right]_{H \bullet E_{No=17}}$$

$$\left[41^3_{\circ} = 2^3_{\circ} + 17^3_{\circ\,\circ} + 40^3_{\circ\,\circ\,\circ}\right]_{H \bullet E_{No=18}}$$

$$\left[41^3_{\circ} = 6^3_{\circ} + 32^3_{\circ\,\circ} + 33^3_{\circ\,\circ\,\circ}\right]_{H \bullet E_{No=19}}$$

$$\left[42^3_{\circ} = 21^3_{\circ} + 28^3_{\circ\,\circ} + 35^3_{\circ\,\circ\,\circ}\right]_{H \bullet E_{No=20}}$$

$$\left[44^3_{\circ} = 16^3_{\circ} + 23^3_{\circ\,\circ} + 41^3_{\circ\,\circ\,\circ}\right]_{H \bullet E_{No=21}}$$

$$\left[45^3_{\circ} = 5^3_{\circ} + 30^3_{\circ\,\circ} + 40^3_{\circ\,\circ\,\circ}\right]_{H \bullet E_{No=22}}$$

$$\left[46^3_{\circ} = 3^3_{\circ} + 36^3_{\circ\,\circ} + 37^3_{\circ\,\circ\,\circ}\right]_{H \bullet E_{No=23}}$$

$$\left[46^3_{\circ} = 27^3_{\circ} + 30^3_{\circ\,\circ} + 37^3_{\circ\,\circ\,\circ}\right]_{H \bullet E_{No=24}}$$

$$\left[48^3_{\circ} = 24^3_{\circ} + 32^3_{\circ\,\circ} + 40^3_{\circ\,\circ\,\circ}\right]_{H \bullet E_{No=25}}$$

$$\left[50^3_{\circ} = 8^3_{\circ} + 34^3_{\circ\,\circ} + 44^3_{\circ\,\circ\,\circ}\right]_{H \bullet E_{No=26}}$$

$$\left[53^3_{\circ} = 29^3_{\circ} + 34^3_{\circ\,\circ} + 44^3_{\circ\,\circ\,\circ}\right]_{H \bullet E_{No=27}}$$

$$\left[54^3_{\circ} = 6^3_{\circ} + 36^3_{\circ\,\circ} + 48^3_{\circ\,\circ\,\circ}\right]_{H \bullet E_{No=28}}$$

$$\left[54^3_{\circ} = 12^3_{\circ} + 19^3_{\circ\,\circ} + 53^3_{\circ\,\circ\,\circ}\right]_{H \bullet E_{No=29}}$$

$$\left[54^3_{\circ} = 27^3_{\circ} + 36^3_{\circ\,\circ} + 45^3_{\circ\,\circ\,\circ}\right]_{H \bullet E_{No=30}}$$

$$\left[56^3_{\circ} = 36^3_{\circ} + 38^3_{\circ\,\circ} + 42^3_{\circ\,\circ\,\circ}\right]_{H \bullet E_{No=31}}$$

$$[57^3 = 9^3 + 30^3 + 54^3]_{H\cdot E_{No=32}}$$

$$[58^3 = 15^3 + 42^3 + 49^3]_{H\cdot E_{No=33}}$$

$$[58^3 = 22^3 + 30^3 + 54^3]_{H\cdot E_{No=34}}$$

$$[60^3 = 21^3 + 42^3 + 51^3]_{H\cdot E_{No=35}}$$

$$[60^3 = 30^3 + 40^3 + 50^3]_{H\cdot E_{No=36}}$$

$$[63^3 = 7^3 + 42^3 + 56^3]_{H\cdot E_{No=37}}$$

$$[66^3 = 33^3 + 44^3 + 55^3]_{H\cdot E_{No=38}}$$

$$[67^3 = 22^3 + 51^3 + 54^3]_{H\cdot E_{No=39}}$$

$$[69^3 = 36^3 + 38^3 + 61^3]_{H\cdot E_{No=40}}$$

$$[70^3 = 7^3 + 54^3 + 57^3]_{H\cdot E_{No=41}}$$

$$[71^3 = 14^3 + 23^3 + 70^3]_{H\cdot E_{No=42}}$$

$$[72^3 = 8^3 + 48^3 + 64^3]_{H\cdot E_{No=43}}$$

$$[72^3 = 34^3 + 39^3 + 65^3]_{H\cdot E_{No=44}}$$

$$[72^3 = 36^3 + 48^3 + 60^3]_{H\cdot E_{No=45}}$$

$$[75^3 = 12^3 + 51^3 + 66^3]_{H\cdot E_{No=46}}$$

$$[75^3 = 38^3 + 43^3 + 66^3]_{H\cdot E_{No=47}}$$

$$[76^3 = 12^3 + 40^3 + 72^3]_{H\cdot E_{No=48}}$$

$$[76^3 = 31^3 + 33^3 + 72^3]_{H\cdot E_{No=49}}$$

$$[78^3 = 39^3 + 52^3 + 65^3]_{H\cdot E_{No=50}}$$

$$[80^3 = 28^3 + 56^3 + 68^3]_{H\cdot E_{No=51}}$$

$$[81^3 = 9^3 + 54^3 + 72^3]_{H\cdot E_{No=52}}$$

$$[81^3 = 25^3 + 48^3 + 74^3]_{H\cdot E_{No=53}}$$

$$[82^3 = 4^3 + 34^3 + 80^3]_{H\cdot E_{No=54}}$$

$$\left[82^3_{\circ} = 12^3_{\circ} + 64^3_{\circ\ \circ} + 66^3_{\circ\ \circ\ \circ}\right]_{H\bullet E_{No=55}}$$

$$\left[82^3_{\circ} = 19^3_{\circ} + 60^3_{\circ\ \circ} + 69^3_{\circ\ \circ\ \circ}\right]_{H\bullet E_{No=56}}$$

$$\left[84^3_{\circ} = 28^3_{\circ} + 53^3_{\circ\ \circ} + 75^3_{\circ\ \circ\ \circ}\right]_{H\bullet E_{No=57}}$$

$$\left[84^3_{\circ} = 42^3_{\circ} + 56^3_{\circ\ \circ} + 70^3_{\circ\ \circ\ \circ}\right]_{H\bullet E_{No=58}}$$

$$\left[84^3_{\circ} = 54^3_{\circ} + 57^3_{\circ\ \circ} + 63^3_{\circ\ \circ\ \circ}\right]_{H\bullet E_{No=59}}$$

$$\left[85^3_{\circ} = 50^3_{\circ} + 61^3_{\circ\ \circ} + 64^3_{\circ\ \circ\ \circ}\right]_{H\bullet E_{No=60}}$$

$$\left[87^3_{\circ} = 20^3_{\circ} + 54^3_{\circ\ \circ} + 79^3_{\circ\ \circ\ \circ}\right]_{H\bullet E_{No=61}}$$

$$\left[87^3_{\circ} = 26^3_{\circ} + 55^3_{\circ\ \circ} + 78^3_{\circ\ \circ\ \circ}\right]_{H\bullet E_{No=62}}$$

$$\left[87^3_{\circ} = 33^3_{\circ} + 45^3_{\circ\ \circ} + 81^3_{\circ\ \circ\ \circ}\right]_{H\bullet E_{No=63}}$$

$$\left[87^3_{\circ} = 38^3_{\circ} + 48^3_{\circ\ \circ} + 79^3_{\circ\ \circ\ \circ}\right]_{H\bullet E_{No=64}}$$

$$\left[88^3_{\circ} = 21^3_{\circ} + 43^3_{\circ\ \circ} + 84^3_{\circ\ \circ\ \circ}\right]_{H\bullet E_{No=65}}$$

$$\left[88^3_{\circ} = 25^3_{\circ} + 31^3_{\circ\ \circ} + 86^3_{\circ\ \circ\ \circ}\right]_{H\bullet E_{No=66}}$$

$$\left[88^3_{\circ} = 32^3_{\circ} + 46^3_{\circ\ \circ} + 82^3_{\circ\ \circ\ \circ}\right]_{H\bullet E_{No=67}}$$

$$\left[89^3_{\circ} = 17^3_{\circ} + 40^3_{\circ\ \circ} + 86^3_{\circ\ \circ\ \circ}\right]_{H\bullet E_{No=68}}$$

$$\left[90^3_{\circ} = 10^3_{\circ} + 60^3_{\circ\ \circ} + 80^3_{\circ\ \circ\ \circ}\right]_{H\bullet E_{No=69}}$$

$$\left[90^3_{\circ} = 25^3_{\circ} + 38^3_{\circ\ \circ} + 87^3_{\circ\ \circ\ \circ}\right]_{H\bullet E_{No=70}}$$

$$\left[90^3_{\circ} = 45^3_{\circ} + 60^3_{\circ\ \circ} + 75^3_{\circ\ \circ\ \circ}\right]_{H\bullet E_{No=71}}$$

$$\left[90^3_{\circ} = 58^3_{\circ} + 59^3_{\circ\ \circ} + 69^3_{\circ\ \circ\ \circ}\right]_{H\bullet E_{No=72}}$$

$$\left[92^3_{\circ} = 6^3_{\circ} + 72^3_{\circ\ \circ} + 74^3_{\circ\ \circ\ \circ}\right]_{H\bullet E_{No=73}}$$

$$\left[92^3_{\circ} = 54^3_{\circ} + 60^3_{\circ\ \circ} + 74^3_{\circ\ \circ\ \circ}\right]_{H\bullet E_{No=74}}$$

$$\left[93^3_{\circ} = 32^3_{\circ} + 54^3_{\circ\ \circ} + 85^3_{\circ\ \circ\ \circ}\right]_{H\bullet E_{No=75}}$$

$$\left[95^3_{\circ} = 15^3_{\circ} + 50^3_{\circ\ \circ} + 90^3_{\circ\ \circ\ \circ}\right]_{H\bullet E_{No=76}}$$

$$\left[96^3_{\circ} = 19^3_{\circ} + 53^3_{\circ\ \circ} + 90^3_{\circ\ \circ\ \circ}\right]_{H\bullet E_{No=77}}$$

$$\left[96^3_{\circ} = 48^3_{\circ} + 64^3_{\circ\ \circ} + 80^3_{\circ\ \circ\ \circ}\right]_{H \cdot E_{No=78}}$$

$$\left[97^3_{\circ} = 45^3_{\circ} + 69^3_{\circ\ \circ} + 79^3_{\circ\ \circ\ \circ}\right]_{H \cdot E_{No=79}}$$

$$\left[99^3_{\circ} = 11^3_{\circ} + 66^3_{\circ\ \circ} + 88^3_{\circ\ \circ\ \circ}\right]_{H \cdot E_{No=80}}$$

$$\left[100^3_{\circ} = 16^3_{\circ} + 68^3_{\circ\ \circ} + 88^3_{\circ\ \circ\ \circ}\right]_{H \cdot E_{No=81}}$$

$$\left[100^3_{\circ} = 35^3_{\circ} + 70^3_{\circ\ \circ} + 85^3_{\circ\ \circ\ \circ}\right]_{H \cdot E_{No=82}} \qquad \textbf{(2)}$$

>

> $\# X^4 = y^2 + z^2, x^4 = y^3 + z^3, x^4 = y^4 + z^4 + w^4 + v^4$ **by** $H \cdot E$ 2019 − 11 − 16 :

> $c := 0$: **for** x **from** 2 **to** 20 **do for** y **from** 1 **to** 300 **do for** z **from** y **to** 300 **do if** $x^4 = y^2 + z^2$ **then** $c := c + 1$: $print([x[\circ]^4 = y[\circ]^2 + z[\circ\ \circ]^2][H \cdot E[No = c]])$ **fi:od:od:od**:

$$[5^4_\circ = 7^2_\circ + 24^2_{\circ\ \circ}]_{H \cdot E_{No=1}}$$
$$[5^4_\circ = 15^2_\circ + 20^2_{\circ\ \circ}]_{H \cdot E_{No=2}}$$
$$[10^4_\circ = 28^2_\circ + 96^2_{\circ\ \circ}]_{H \cdot E_{No=3}}$$
$$[10^4_\circ = 60^2_\circ + 80^2_{\circ\ \circ}]_{H \cdot E_{No=4}}$$
$$[13^4_\circ = 65^2_\circ + 156^2_{\circ\ \circ}]_{H \cdot E_{No=5}}$$
$$[13^4_\circ = 119^2_\circ + 120^2_{\circ\ \circ}]_{H \cdot E_{No=6}}$$
$$[15^4_\circ = 63^2_\circ + 216^2_{\circ\ \circ}]_{H \cdot E_{No=7}}$$
$$[15^4_\circ = 135^2_\circ + 180^2_{\circ\ \circ}]_{H \cdot E_{No=8}}$$
$$[17^4_\circ = 136^2_\circ + 255^2_{\circ\ \circ}]_{H \cdot E_{No=9}}$$
$$[17^4_\circ = 161^2_\circ + 240^2_{\circ\ \circ}]_{H \cdot E_{No=10}} \quad \textbf{(1)}$$

> $c := 0$: **for** x **from** 2 **to** 20 **do for** y **from** 1 **to** 100 **do for** z **from** y **to** 100 **do if** $x^4 = y^3 + z^3$ **then** $c := c + 1$: $print([x[\circ]^4 = y[\circ]^3 + z[\circ\ \circ]^3][H \cdot E[No = c]])$ **fi:od:od:od**:

$$[2^4_\circ = 2^3_\circ + 2^3_{\circ\ \circ}]_{H \cdot E_{No=1}}$$
$$[9^4_\circ = 9^3_\circ + 18^3_{\circ\ \circ}]_{H \cdot E_{No=2}}$$
$$[16^4_\circ = 32^3_\circ + 32^3_{\circ\ \circ}]_{H \cdot E_{No=3}} \quad \textbf{(2)}$$

> $c := 0$: **for** x **from** 2 **to** 20 **do for** y **from** 1 **to** 100 **do for** z **from** y **to** 100 **do for** w **from** z **to** 100 **do if** $x^4 = y^4 + z^4 + w^3$ **then** $c := c + 1$: $print([x[\circ]^4 = y[\circ]^4 + z[\circ\ \circ]^4 + w[\circ\ \circ\ \circ]^3][H \cdot E[No = c]])$ **fi:od:od:od:od**:

$$[3^4_\circ = 1^4_\circ + 2^4_{\circ\ \circ} + 4^3_{\circ\ \circ\ \circ}]_{H \cdot E_{No=1}} \quad \textbf{(3)}$$

>

> # 円周率　3.xxxN　ラスト桁N=0,1,2,,,,,,9 by H.E:

>

> **for** N **from** 0 **to** 9 **do for** h **from** 1 **to** 1000 **do if** $\mathrm{floor}(\mathit{evalf}(\mathrm{Pi}\cdot 10^{h}, 100)) - \mathrm{floor}(\mathit{evalf}(\mathrm{Pi}\cdot 10^{h-1}, 100))\cdot 10 = N$ **then** $H := h$:**break if**:**od**: $\mathit{print}(3.。。。(N) = \mathit{evalf}(\mathrm{floor}(\mathit{evalf}(\mathrm{Pi}\cdot 10^{H}, 100))\cdot 10^{-H}, H+1))$:**od**:

$$3.。。。(0) = 3.14159265358979323846264338327950$$
$$3.。。。(1) = 3.1$$
$$3.。。。(2) = 3.141592$$
$$3.。。。(3) = 3.141592653$$
$$3.。。。(4) = 3.14$$
$$3.。。。(5) = 3.1415$$
$$3.。。。(6) = 3.1415926$$
$$3.。。。(7) = 3.1415926535897$$
$$3.。。。(8) = 3.14159265358$$
$$3.。。。(9) = 3.14159 \quad (1)$$

>

ありがとう