数学日記

愛と理想

第一日

一つの思いつき、それに、愛情を注ぎ

理想が育てる。

やがて、愛が実り, 一つの学問の芽が芽生える。

それを、理想を持って、研究する

その成果をみんなが楽しむ。ありがとう

目次

発行　数学友の会監修

２０１２－３－８

今日のトピック

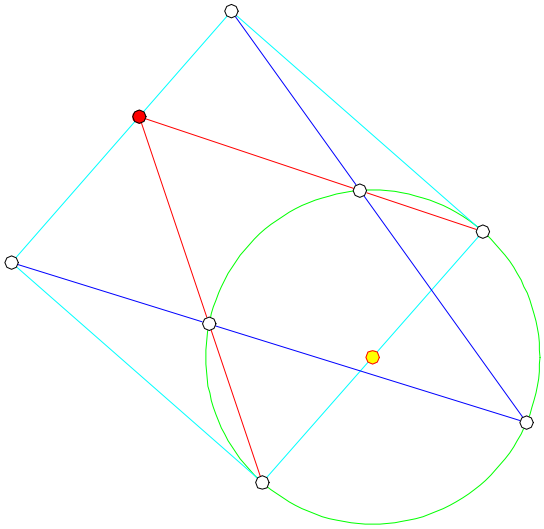
ピタゴラスの周辺

直角三角形の斜辺の正方形と直角頂点と外接円利用

HI−2012−3−8

日々の課題

正方形と直径円



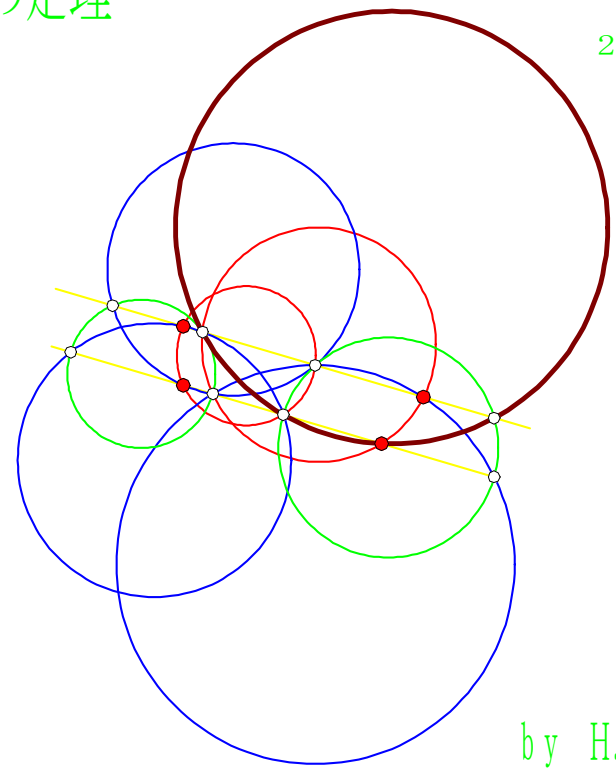
共線定理

蛭子井博孝

どんぶりと箸の定理　HI-053

八個の円の定理

2008-1-21



by H. EBISUI

```
> # Prime Prime by H.E:
> # Prime Property:
> restart :
> print(Pn = n, P, ((P^P + 1)^P Mod P), (((P^P + 1)^P + 1)^P Mod P), ((((P^P + 1)^P + 1)^P
      + 1)^P Mod P));
```

$$Pn = n, P, (P^P + 1)^P \bmod P, ((P^P + 1)^P + 1)^P \bmod P, (((P^P + 1)^P + 1)^P + 1)^P \bmod P \qquad (1)$$

```
> for n from 1 to 100 do P := ithprime(n) : print(Pn = n, P, ((P^P + 1)^P mod P),
      (((P^P + 1)^P + 1)^P mod P), ((((P^P + 1)^P + 1)^P + 1)^P mod P));od:
```

$$Pn = 1, 2, 1, 0, 1$$
$$Pn = 2, 3, 1, 2, 0$$
$$Pn = 3, 5, 1, 2, 3$$
$$Pn = 4, 7, 1, 2, 3$$
$$Pn = 5, 11, 1, 2, 3$$
$$Pn = 6, 13, 1, 2, 3$$
$$Pn = 7, 17, 1, 2, 3$$
$$Pn = 8, 19, 1, 2, 3$$
$$Pn = 9, 23, 1, 2, 3$$
$$Pn = 10, 29, 1, 2, 3$$
$$Pn = 11, 31, 1, 2, 3$$
$$Pn = 12, 37, 1, 2, 3$$
$$Pn = 13, 41, 1, 2, 3$$
$$Pn = 14, 43, 1, 2, 3$$
$$Pn = 15, 47, 1, 2, 3$$
$$Pn = 16, 53, 1, 2, 3$$
$$Pn = 17, 59, 1, 2, 3$$
$$Pn = 18, 61, 1, 2, 3$$

```
Warning,  computation interrupted
>
```

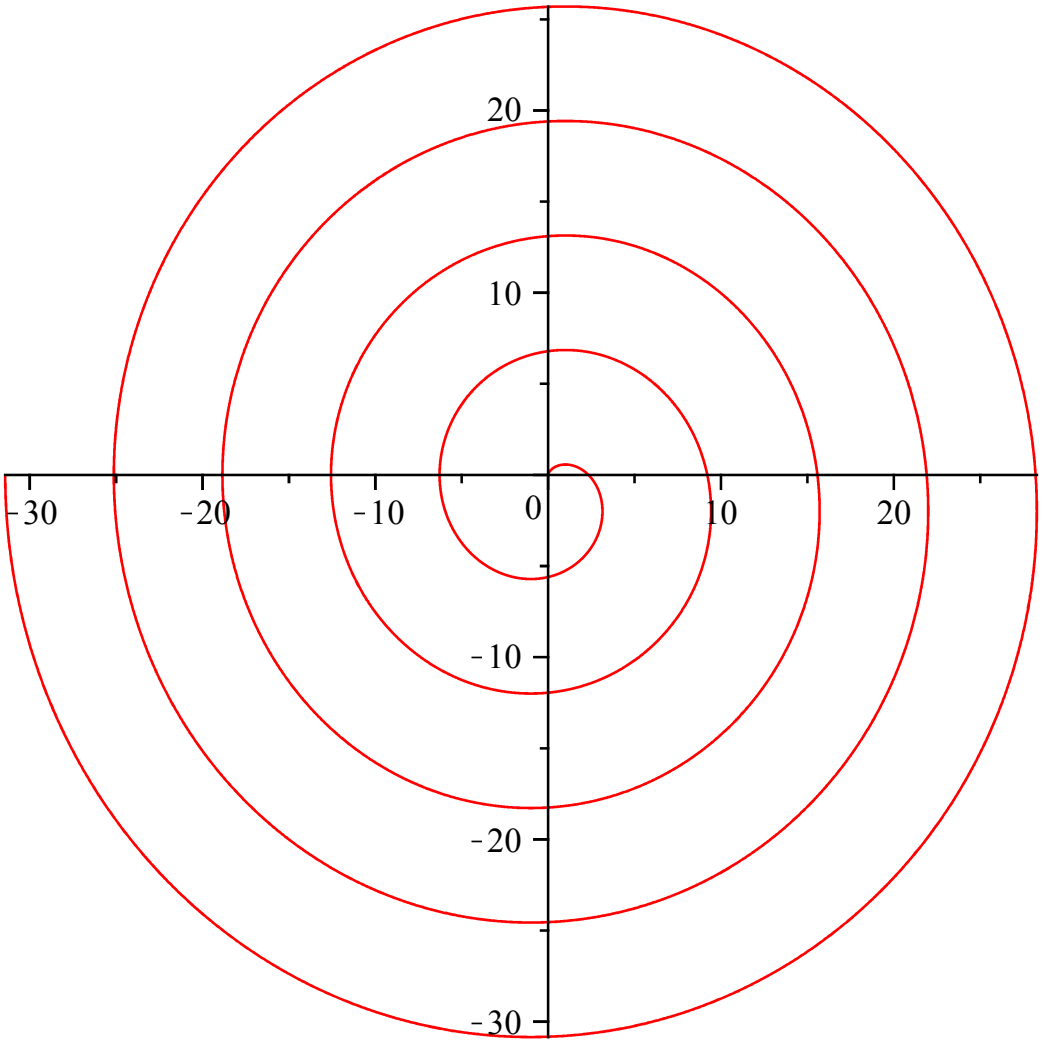
```
> # Spiral EQG by H.E:
> SPx := int(sin(x)·x, x = 0 ..t);
```

$$SPx := \sin(t) - \cos(t)\ t \tag{1}$$

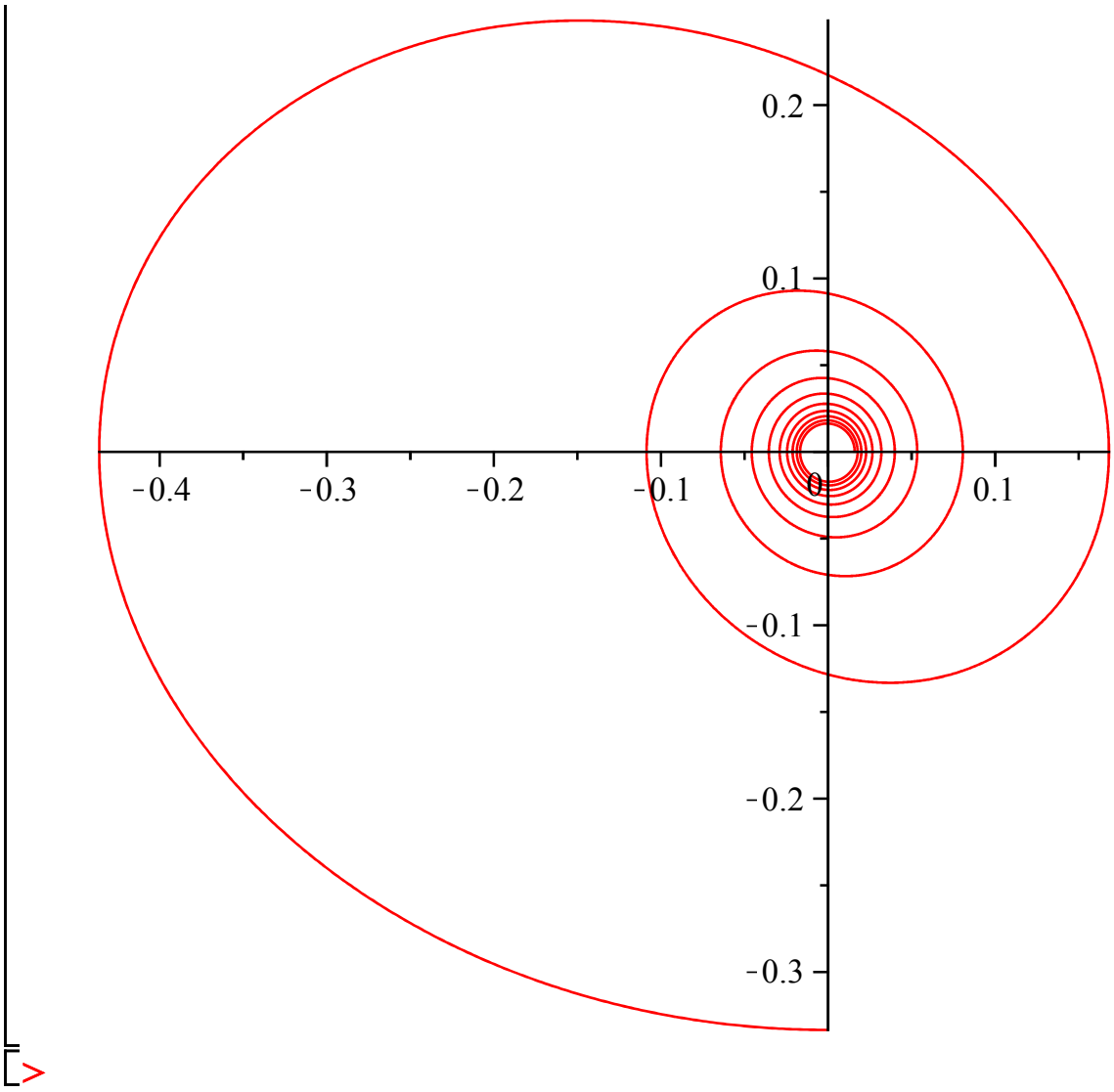
```
> SPy := int(cos(x)·x, x = 0 ..t);
```

$$SPy := -1 + \cos(t) + \sin(t)\ t \tag{2}$$

```
> plot( [SPx, SPy, t = 0 ..10·Pi], numpoints = 10000);
```

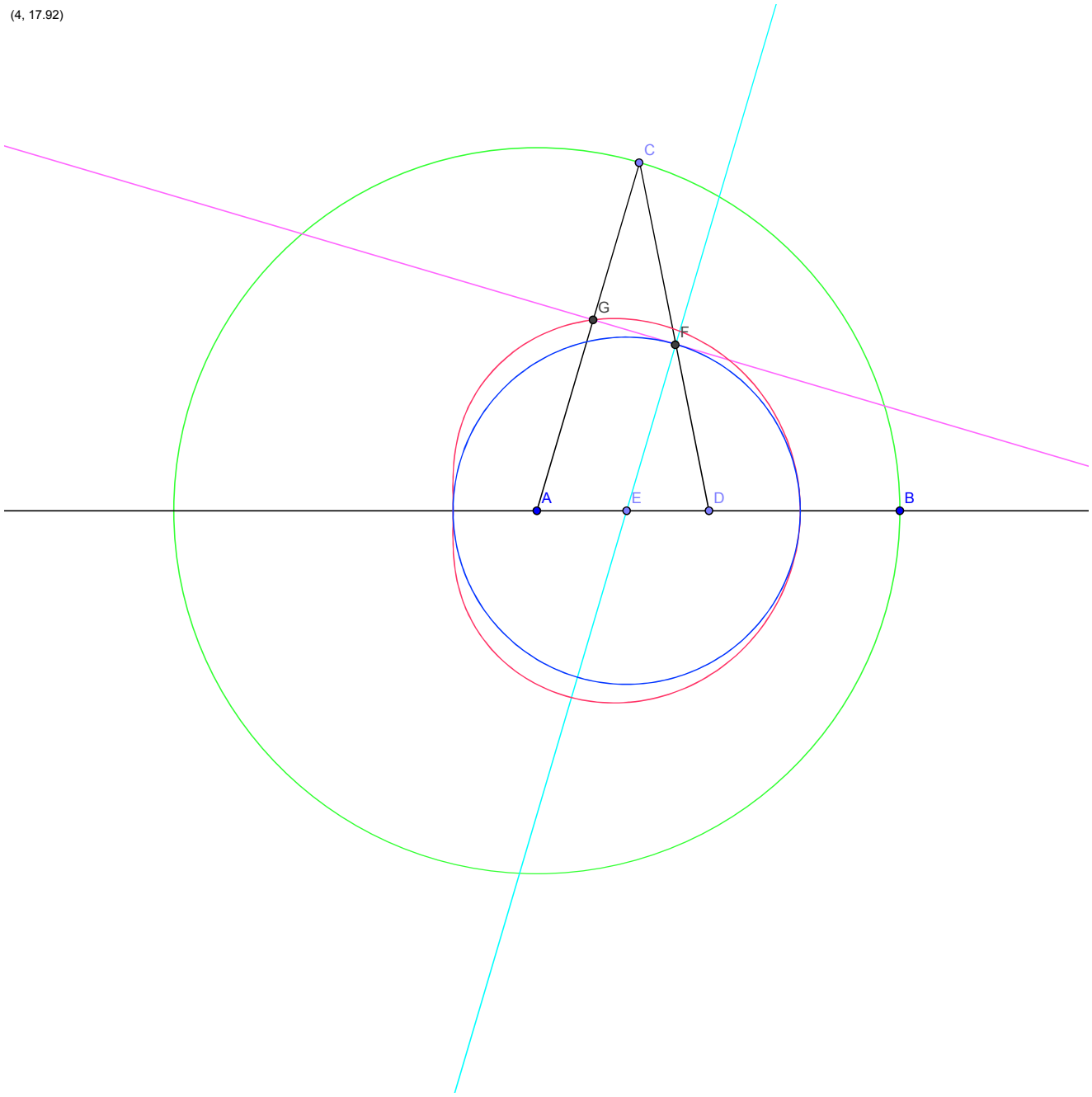



```
> plot( [diff( sin(x)/x, x), diff( diff( sin(x)/x, x), x), x = 0 ..20·Pi], numpoints = 10000);
```


0.2
0.1
-0.4
-0.3
-0.2
-0.1
0
0.1
-0.1
-0.2
-0.3

Doval no 補助基点の軌跡

H.Ebisui



リフレッシュコーナー
俳句と五行歌

泉湧く　奥山深く　春近く

泉湧く　冷たき世間　やがて春

こんこんと　湧くや泉の　水清し

今日から

数学日記

アイデアが

泉のごとく

きれいに湧いた。

時は、少しづつ

過ぎてゆく

でも

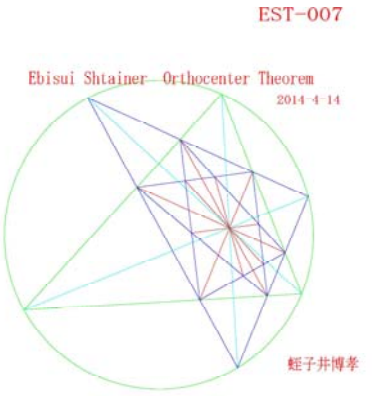
数学の泉の水

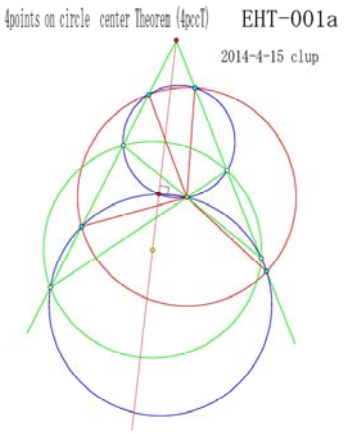
おいしいな

Geomatics Diary 64th

Maria Intagliata and Hirotaka Ebisui

our Love





contents

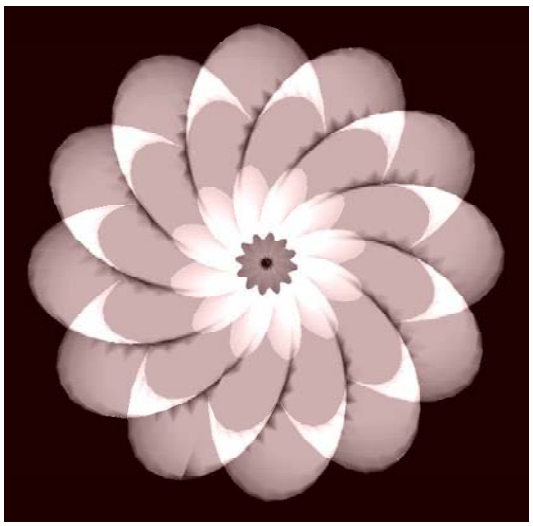
Short Note

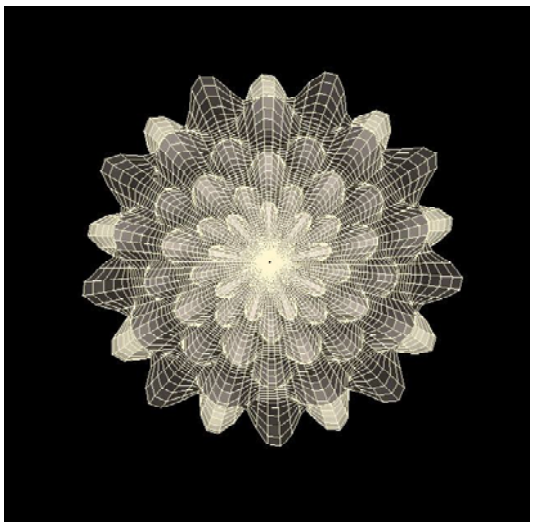
Today, we started again to make our Geomatics Diary 64th(our this year age). We write about Love and Hirotaka chose SubTitle (our Love(FigureJPG)) .H will make 1.2.3.5.7.8, and M will make 4. , and M and H write 6. H makes One Haiku, Here.

「Sa shi ki shi ta Ba ra no wa ka ba ga Me wo da shi ta」 (The leaves that H planted Last year in Pot opened with Lolve) by H.E

Oval Research Center
http://eh85.blogzine.jp/
http://hoval.blogzine.jp/

4. まりあ’3D





6. DOC Title "LOVE" by Maria and Hirotaka

In Italian

L’AMORE by M

L’amore vero è fonte di felicità; dà serenità all’altro, comprendendone ansie, dolori ed esigenze, sostenendolo con gioia, gentilezza e generosità. Amare è sentire la sua assenza come un grande vuoto, è desiderare le sue carezze, le sue parole, i suoi sguardi. E’ voler navigare nel suo mare infinito, per conoscerne la forza delle onde ma anche la calma e la dolcezza della risacca. L’amore è l’unica casa di due anime, che in essa trovano protezione, serenità, gioia, tenerezza ma anche difficoltà da condividere e superare. L’amore delle anime è il più bello , il più puro, non ubbidisce agli istinti ma solo al cuore e alla mente. Ma fra innamorati l’amore si completa col contatto fisico, perché amare vuol dire donarsi: anima e corpo, anche se l’amplesso, senza attrazione mentale, non è amore ma solo piacere sessuale. Ci sono tanti “amori” : amore coniugale, genitoriale, filiale, amore per il proprio Dio, per la Natura, per la Pace, per il prossimo, per la famiglia, per il proprio lavoro, per l’arte etc , ma in tutti questi amori le caratteristiche sono comuni a quelle dell’Amore Universale, motore del Cosmo, che, come dice Dante: “move il Sole e l’altre stelle”. Come non considerare, in questa sede, l’amore per Lei: la dea Matematica, la meravigliosa femmina immortale? Ha forme bellissime e perfette. E’ elegante, raffinata, rigorosa, logica e formale, altera eppure umile, a volte impenetrabile, profondamente umana e generosa, passionale, travolgente, intrigante e seducente, ma anche leggera, capricciosa e divertente. L’amore per lei è riuscire a penetrare nella sua intimità, sacrificando tutto, donandole il proprio intelletto e la propria disponibilità. La ama chi, con caparbietà e passione, cerca di scoprire e di comprendere le verità che essa possiede e nasconde. L’amore non si spiega, si vive e può possederti al di là dei confini, delle barriere, delle distanze, dei pregiudizi, della ragionevolezza e della volontà. Non si compra, né si vende: si dona!

In English

LOVE

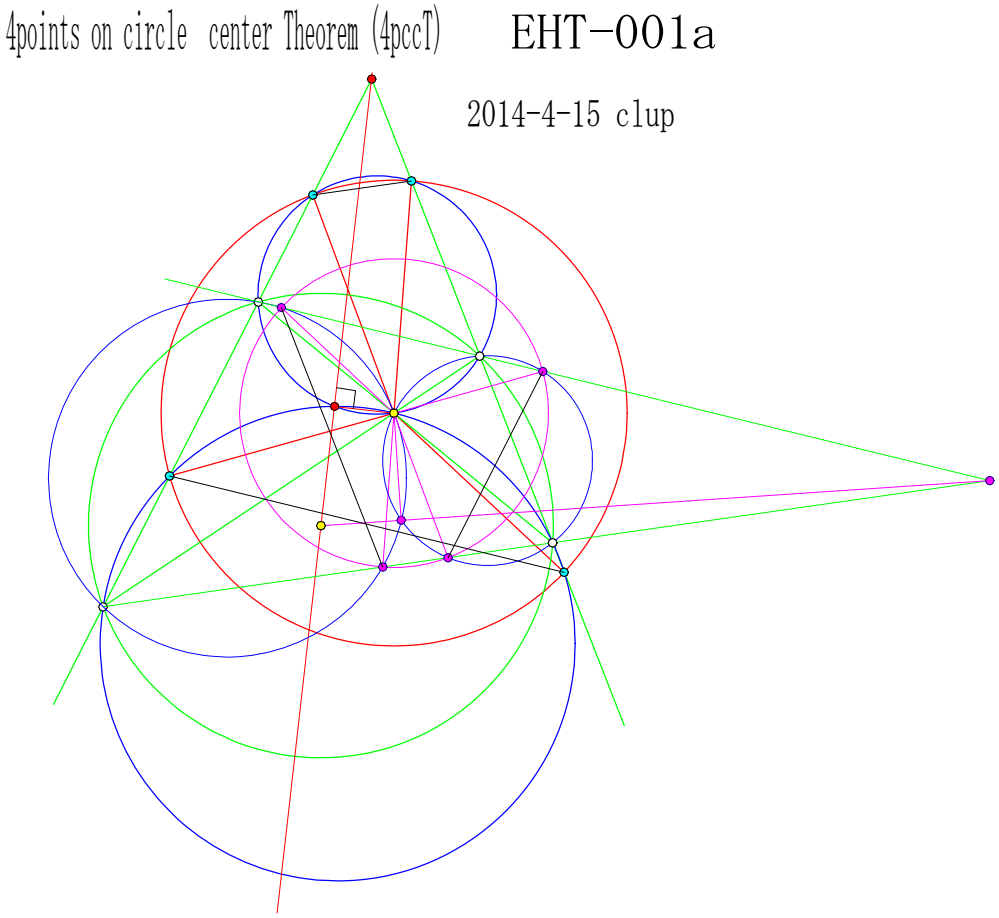
True love is a source of happiness ; it gives peace of mind to other , understanding his anxieties, sorrows and needs, supporting him with joy , kindness and generosity. Loving is to feel his absence as a big empty, to want his caresses , his words , his looks . It’s to want to navigate his endless sea , to know the force of his waves but also the calm and sweetness of the surf. Love is the only home of two souls that find in it security , serenity , joy, tenderness , but also sharing and overcoming difficulties . The love of souls is the most beautiful, the most pure, it does not obey the instincts but only to the heart and mind. But the love between lovers is complete with physical contact , because love means giving oneself : body and soul, even if embrace without mental attraction , is not love but just sexual pleasure. There are so many " loves" : conjugal love , parental , filial love, love for God , for nature, for Peace, for others, for the family, for own work , art , etc. , but in all loves there are features that are common to those of Universal Love , the engine of the Cosmos, which , as Dante says , " moves the sun and the other stars ." How can we not consider , in this context , the love for Her, the goddess Mathematics , the beautiful , immortal female? She has wonderful and perfect forms . She’s elegant , sophisticated, rigorous , logical and formal , proud yet humble , sometimes impenetrable , deeply humane and generous , passionate, captivating , intriguing and seductive, but also light , whimsical and fun. To love her means to be able to penetrate into her intimacy , sacrificing everything, giving her own intellect and availability . Loves her who , with determination and passion, seeks to discover and understand the truth that she owns and hides .

Love can not be explained , you live it , that may possess you beyond the boundaries , barriers , distances , prejudice , reason and the will. You can not buy or sell it : you give it as a gift !

愛　　by　H

愛とは、気恥ずかしいことと思っていた、青春。そして、今は、情熱とともに、愛おしみと思うようになった。愛に飢え、性に餓え、過ごした 30 年、今や、愛は、「数学の女神から、頂けるようになった。」と、思える自分である。　不思議な年月である。もう、活きる愛に、満足している。我唯足を知る。何か、不思議な人生である。幾何学を愛し続けて 50 年本当に、自分が、愛に恵まれていたと、感謝している。ありがとう。

Love is shame thing, I thought in younger days. And, now love is lovelish thing with passion, I think. I desired Love and wanted love Sex for 30 years after devose. But, Now, Love is given by GeoMatics Godless, I can think. Interesting Years passed. It is enough for me to enjoy Passion Love from Cosmos. My life is funny. I continued to love geometry for 50 years and Loves are given by living . Thank you for all.



数学日記

愛と理想

第２日

一つの思いつきに夢中になり，
時を忘れ、ＰＧの改良に励む。
やがて、愛が実り，一つのＰＧができる。
それを、保存するまもなく、次の改良を思いつく

。。。。。。
その成果をみんなが楽しむ。ありがとう

*トピック
モーレーの正三角形の定理の周辺
* 幾何と代数新作問題
解説　点線円幾何学
素数遊び(x mod y)=1 作り
五行歌　俳句
題　春霞み
*新作　式とグラフ（EQG）
らせん［f(x),diff(f(x)］
連載
Doval 幾何学入門

発行　数学友の会　監修：蛭子井博孝

２０１２－３－９

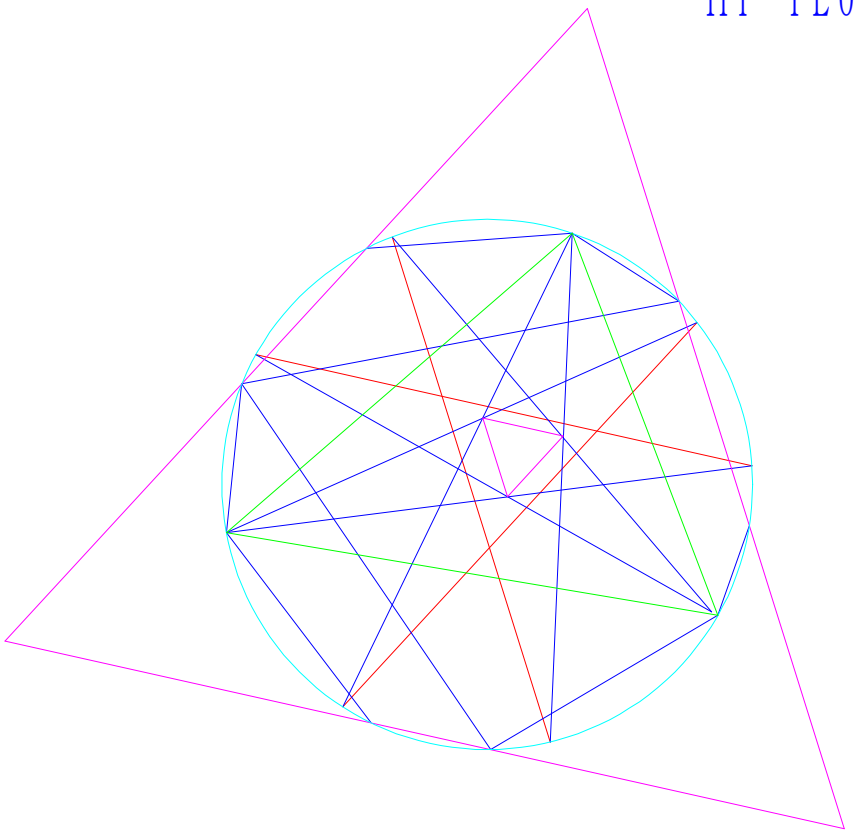
今日のトピック

モーレーの正三角形の周辺

外角の 3 等分線と外接円利用

モーレーの正三角形の周辺

HI-TL0309



蛭子井博孝

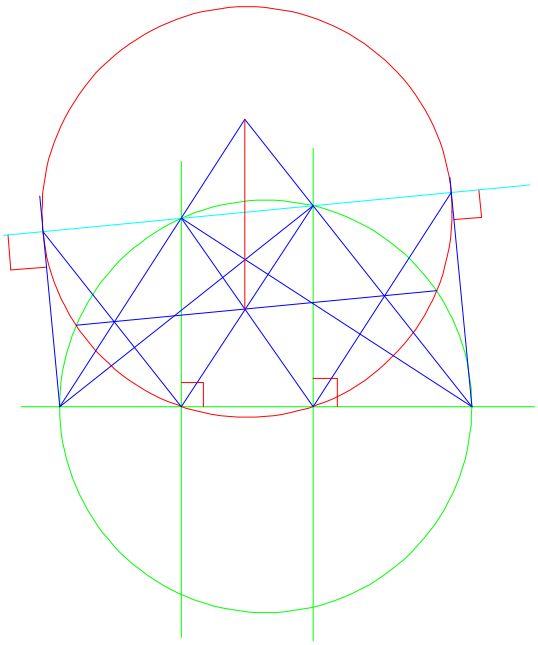
解説　点線円幾何学

HI-029

条件円に交わる平行線の交点を通る線より

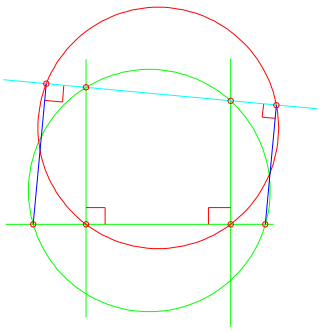
直径と垂線利用

共線定理



HI-029

2008-1-1 4



by H.EBISUI

```
> # Prime Prime by H.E:
> c := 0 : s := 0 :for n from 2 to 100 do for m from 2 to n do s := s + 1 : x := ithprime(n) :
    y := ithprime(m) : z := x mod y :if z = 1 then c := c + 1 : print( No = [c, s],
  evalf( c / s ), [n, m], [x, MOD, y] = z )fi:od:od:
```

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>

リフレッシュコーナー
　　俳句と五行歌

　春霞む　君の顔にも　陰りあり

　霞む春　淡き心に　恋の花

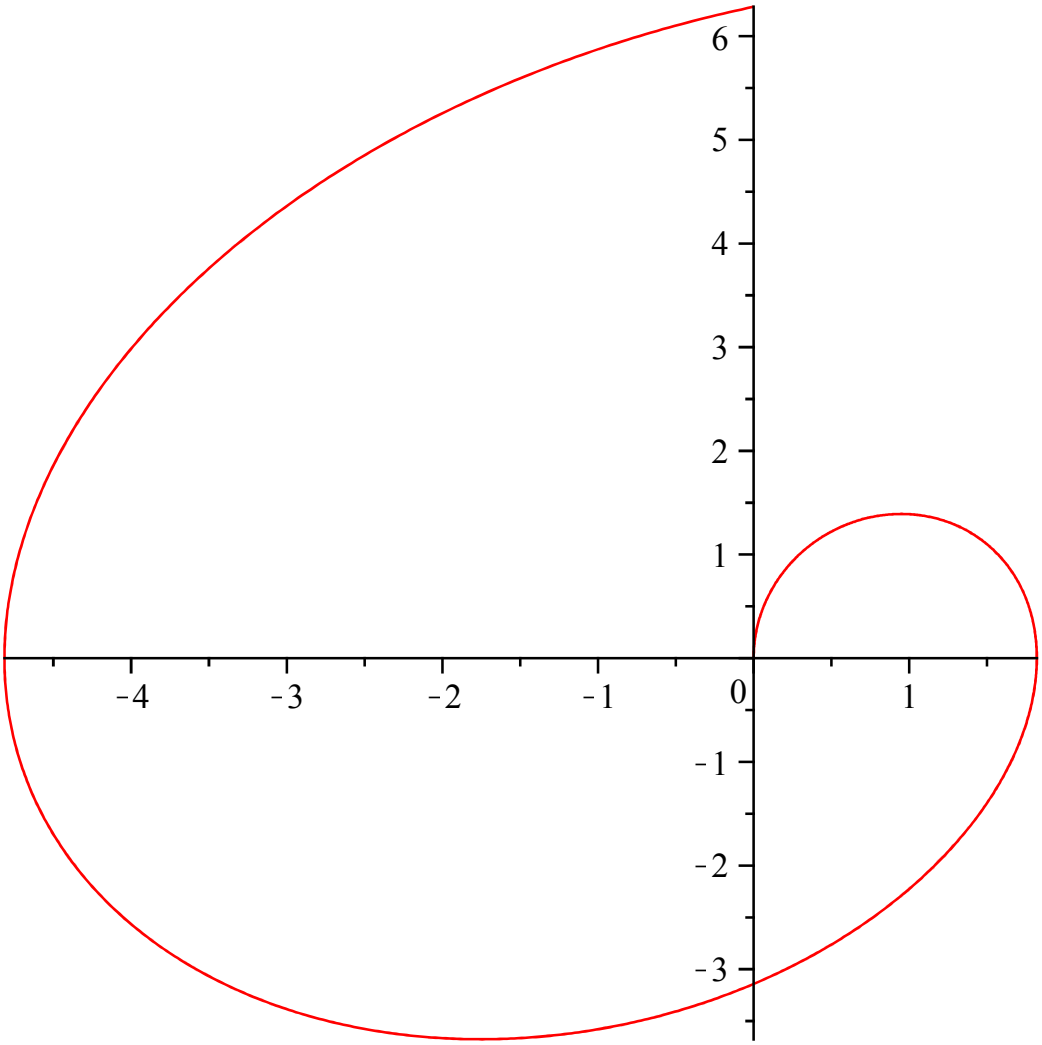
さんさんと　残雪光　解けてゆく

今日も
プログラムに
夢中
0 掛けて
スウィッチ

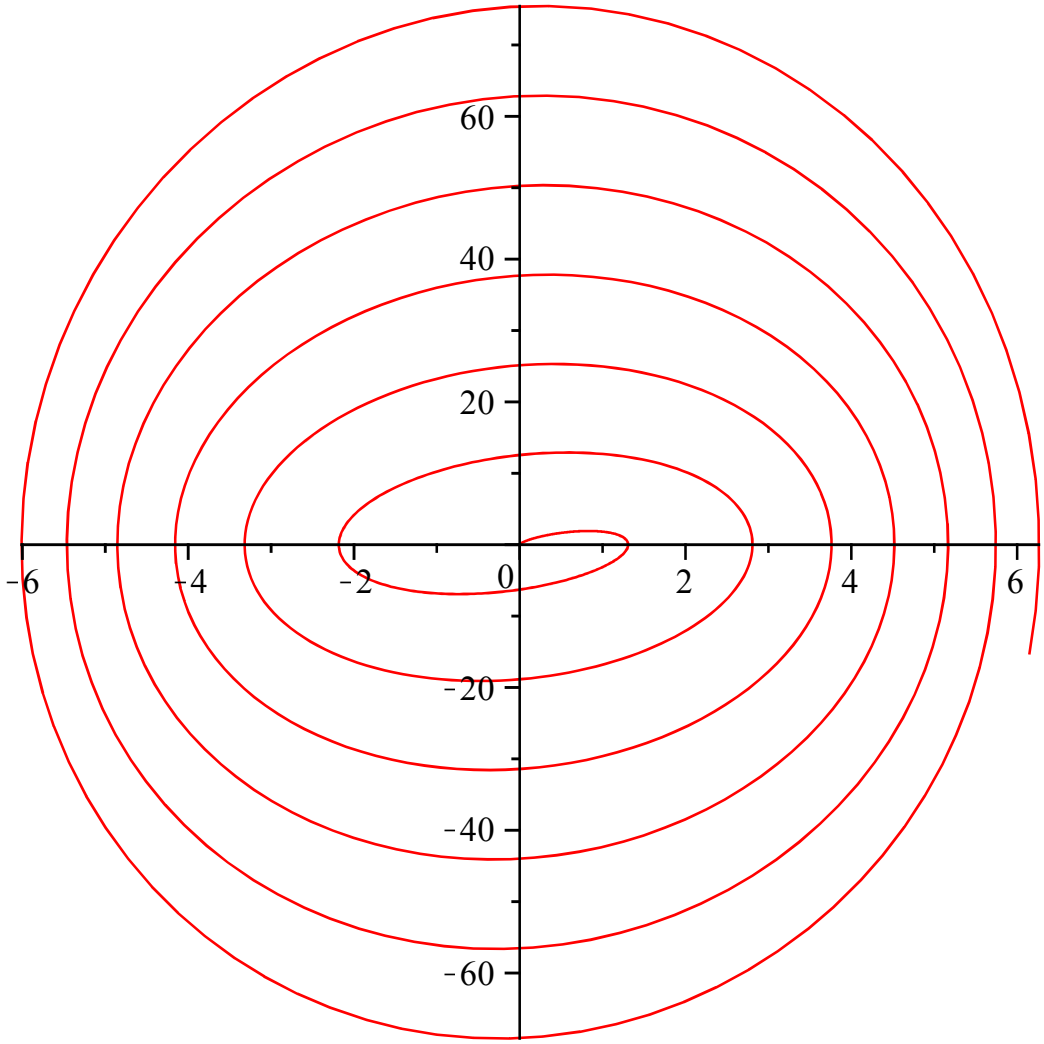
ああ、君がいた
あの頃
すべてが
生き活きと
君の横顔

弧庵

```
> # Spiral EQG by H.E:
> with(plots):
> for h from 1 to 2 do HEQG := [t·sin(t^h), diff(t·sin(t^h), t), t = 0..2·Pi]:
    print(plot(HEQG, numpoints = 1000)); print(EQ = HEQG) :od:
```



$$EQ = [t\sin(t), \sin(t) + t\cos(t), t = 0..2\,\pi]$$

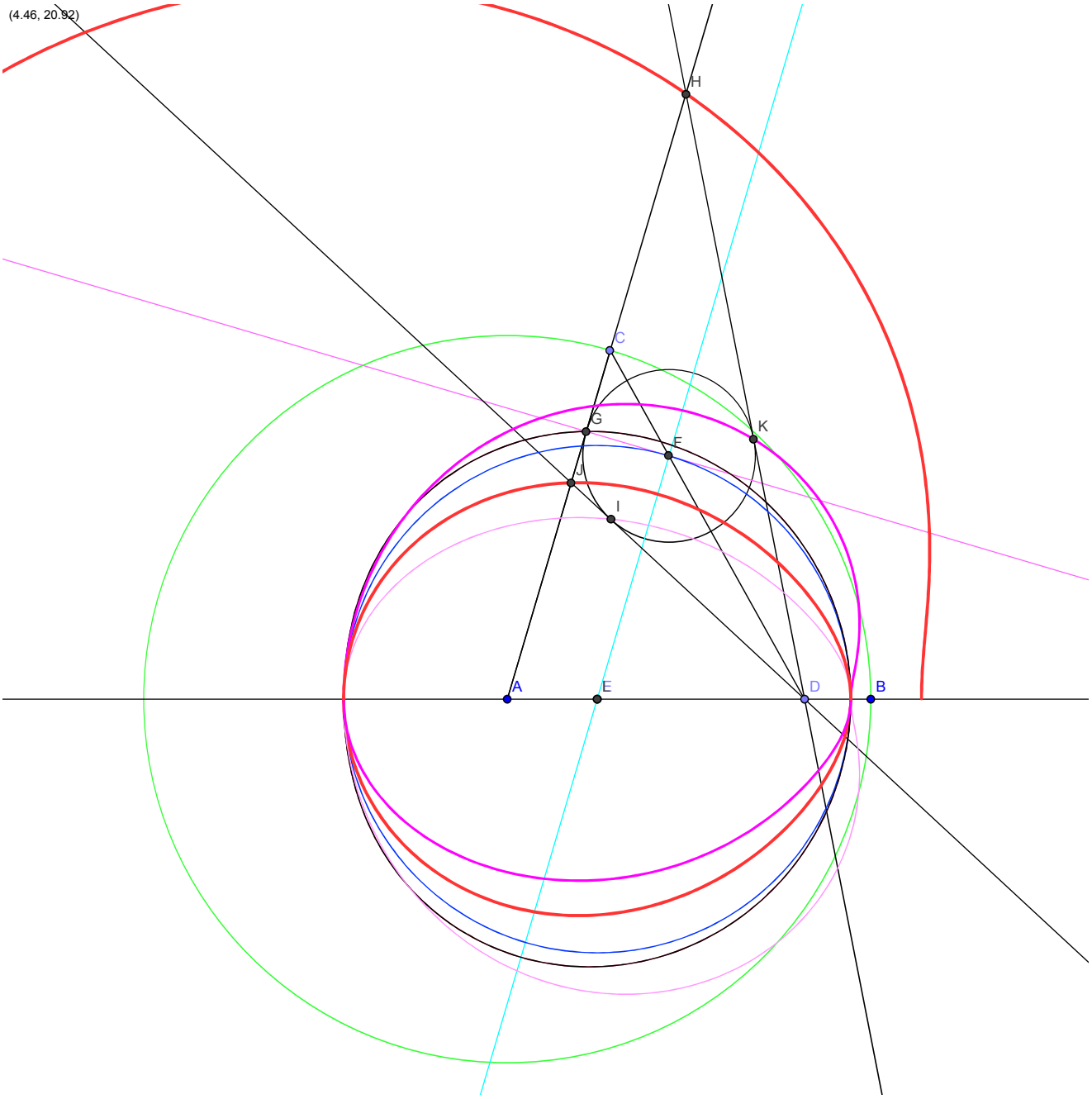


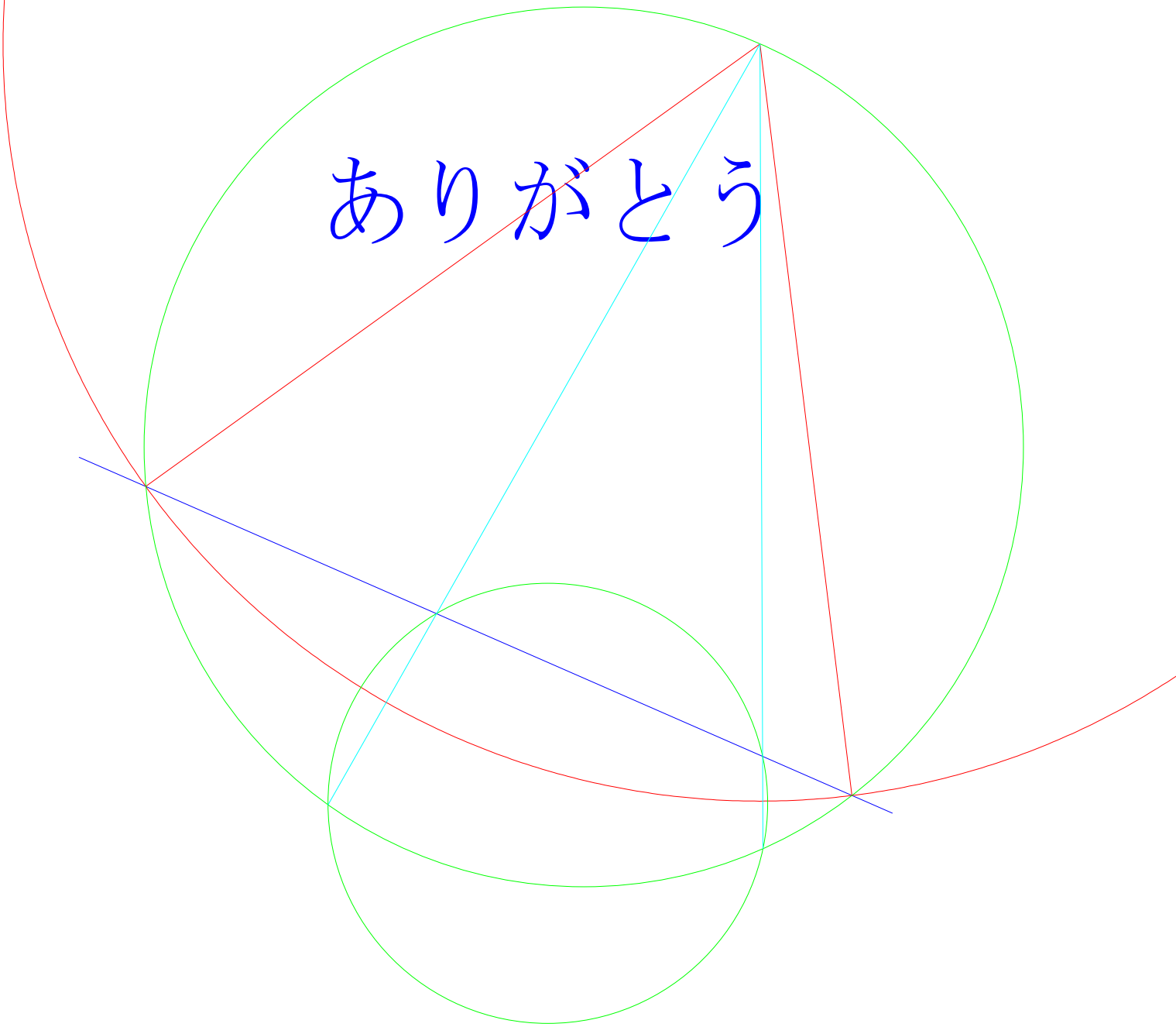
$$EQ = \left[t \sin\left(t^2\right), \sin\left(t^2\right) + 2\, t^2 \cos\left(t^2\right), t = 0..2\,\pi \right] \quad \textbf{(1)}$$

>

Doval ＋ 補助基点の軌跡I

H.Ebisui - 2012/03/09





(HEX61)

数学日記

愛と理想

蛭子井博孝編著

第３日

眠れぬ夜

また、始めた。今日の日記作り
きっと, おもしろいテーマに出会うだろう
今日は、ポンスレーの定理の周辺を歩いてみる

。。。。。。

きっと、みんなが楽しめる成果が出るだろう
ありがとう。

*トピック

ポンスレーの定理の周辺

* 幾何と代数新作問題

解説　　点線円幾何学　HI-310

素数遊び（x mod y）＝0 作り

五行歌　俳句

題　おぼろ月

*新作　式とグラフ（EQG）

らせん［f(x),int(f(x)）］

連載

Doval 幾何学入門

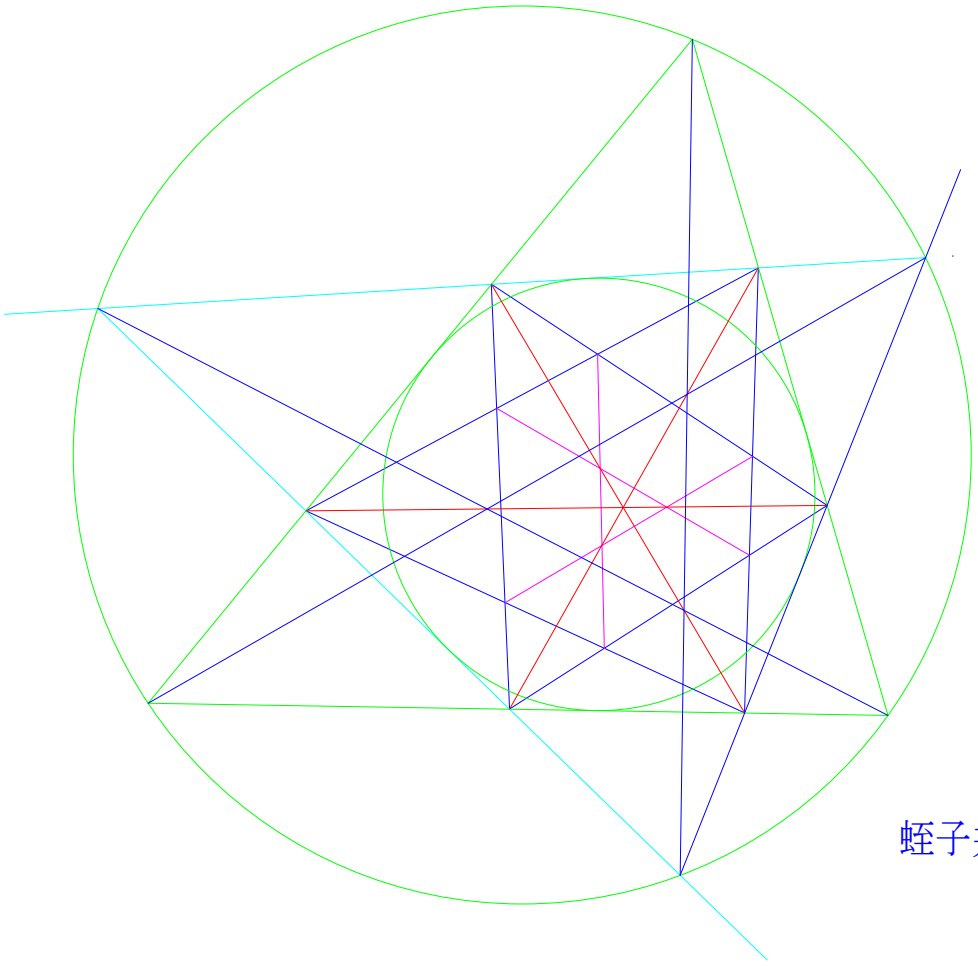
第一作図定理　第三作図定義

2012-3-10

今日のトピック

HI-TL0310-ap

ポンスレーの閉形定理の周辺



蛭子井博孝：

解説　点線円幾何学

HI-310

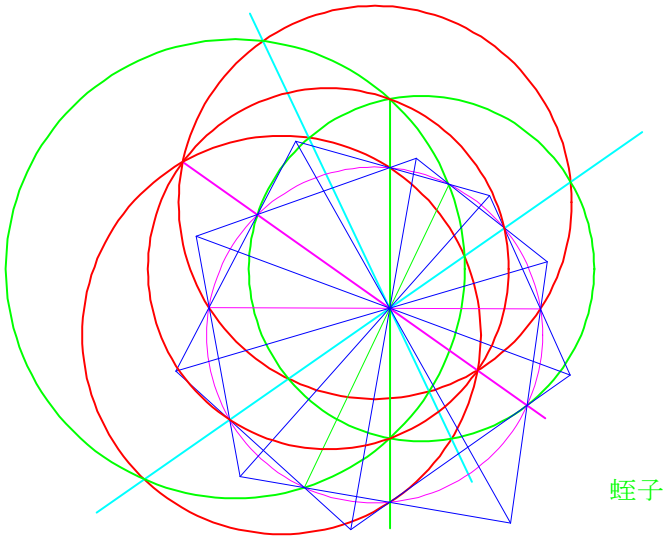
はじめに緑の円２つ　次に,2 円の根軸上の一点を通る
2 つの水色線を引く。すると、3 つの共円赤が現れる
すると、。。。。たくさんの定理が含まれている

HI-310

５円の根軸定理

2008-9-19

６円の根軸定理



蛭子井博孝

```
> # Prime Prime by H.E:
> c := 0 : s := 0 :for n from 2 to 50 do for m from 2 to n do s := s + 1 : x := ithprime(n) : y
    := ithprime(m) : X := (x^2 + 2·x) : Y := y : z := X mod Y :if z = 0 then c := c + 1 :
    print(No = [c, s], evalf(c/s, 5), [n, m], [x, y], [X, Y], [X, MOD, Y] = z)fi:od:od:
```

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$No = [111, 1177], 0.094308, [50, 2], [229, 3], [52899, 3], [52899, MOD, 3] = 0$
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$No = [113, 1180], 0.095763, [50, 5], [229, 11], [52899, 11], [52899, MOD, 11] = 0$
$No = [114, 1225], 0.093061, [50, 50], [229, 229], [52899, 229], [52899, MOD, 229] = 0$ **(1)**

>

リフレッシュコーナー
　　俳句と五行歌

　おぼろ月　天井に　いてくれた

　菜の花や　おぼる月夜に　夢淡し

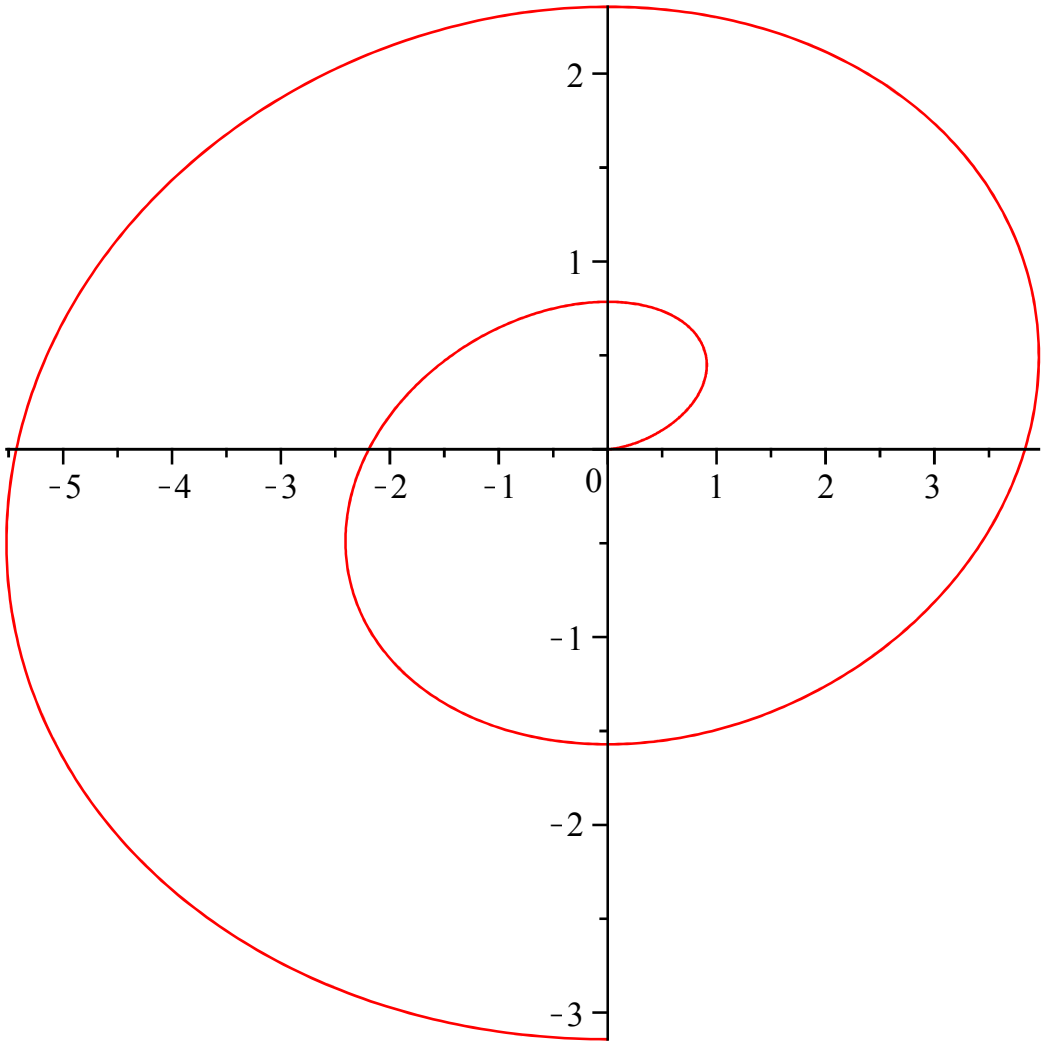
春空気　おぼろ月夜の　おぼろ揺れ

今日は
眠られないよ
夢中
時間が 3 時間経過
あと少しで完成

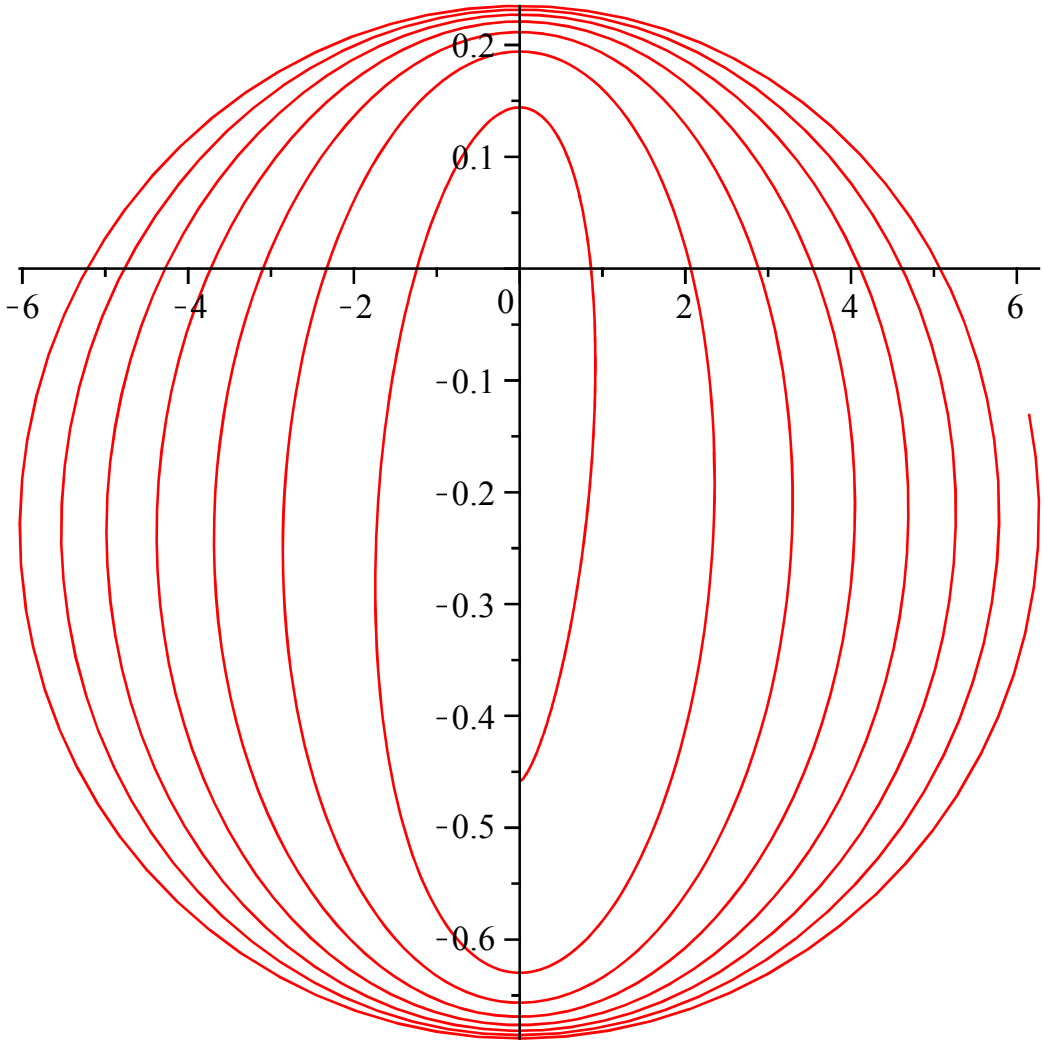
ああ、明日は
あの日
すべてを飲み込んだ
大津波
今生きている不思議

弧庵

```
> # Spiral EQG by H.E:
> with(plots) :
> for h from 1 to 2 do HEQG := [t·sin(t + t^h), int(t·sin(t + t^h), t), t = 0 ..2·Pi] :
      print(plot(HEQG, numpoints = 1000)); print(EQ = HEQG) :od:
```



$$EQ = \left[t \sin(2\,t),\ \frac{1}{4} \sin(2\,t) - \frac{1}{2}\, t \cos(2\,t),\ t = 0 \,..2\,\pi \right]$$

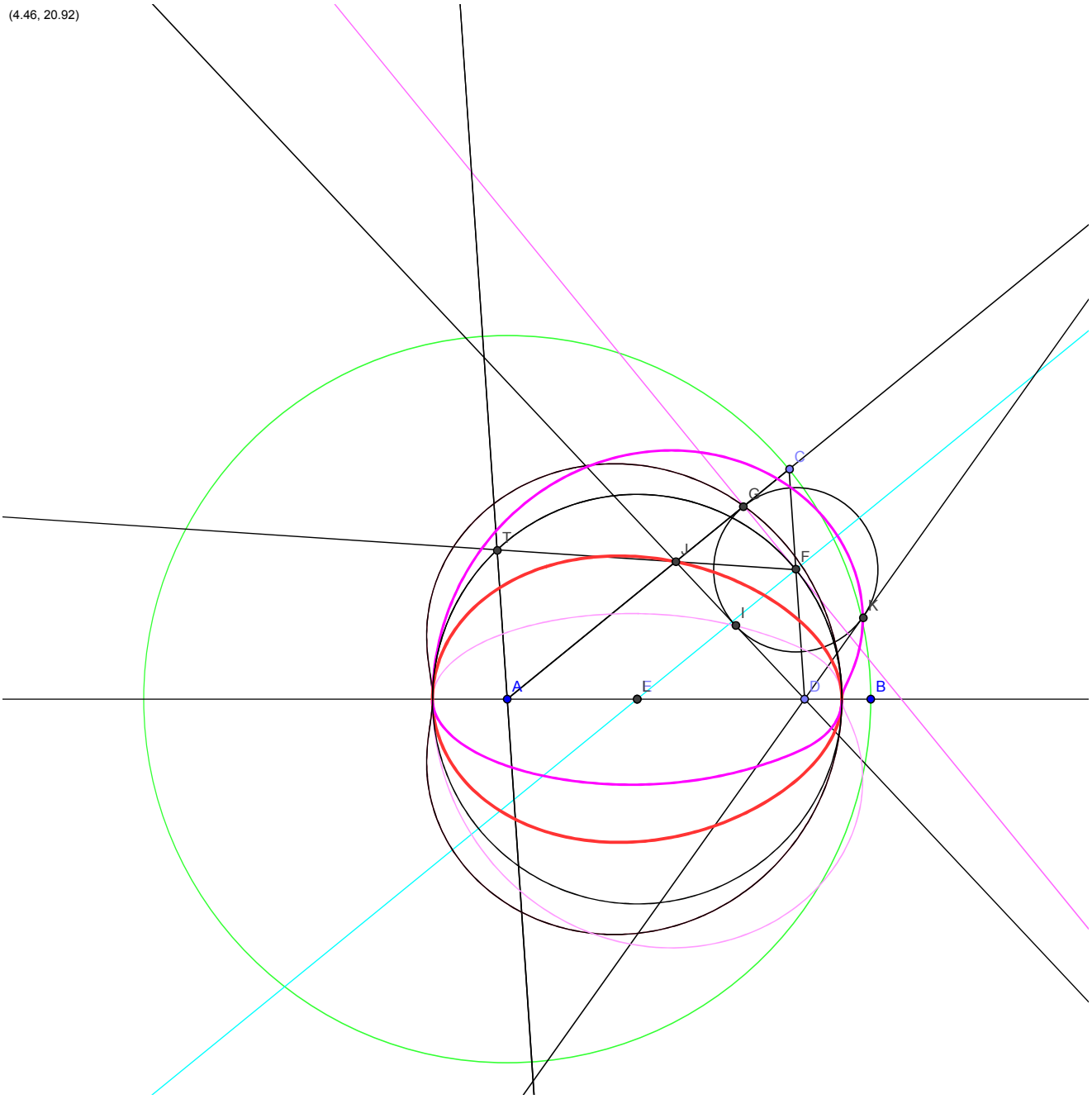


$$EQ = \left[t\sin\left(t+t^2\right),\ -\frac{1}{2}\cos\left(t+t^2\right) - \frac{1}{4}\sqrt{2}\sqrt{\pi}\left(\cos\left(\frac{1}{4}\right)\mathrm{FresnelS}\left(\frac{\sqrt{2}\left(t+\frac{1}{2}\right)}{\sqrt{\pi}}\right) - \sin\left(\frac{1}{4}\right)\mathrm{FresnelC}\left(\frac{\sqrt{2}\left(t+\frac{1}{2}\right)}{\sqrt{\pi}}\right)\right),\ t=0..2\pi \right] \quad (1)$$

>

Doval ＋ 補助基点の軌跡I

H.Ebisui - 2012/03/10



数学日記

愛と理想

蛭子井博孝編著

第４日

2011 年 3 月 11 日　を記憶に

黒い波　テレビに釘付け, あの日あのとき
本当に、息をのみ、画面を見つめて、
速く逃げて逃げてと祈った、車が危ない。
波が、襲ってくる。。。。襲ってくる。
今でも、涙である。
怖さより恐れ。
自然の脅威が驚異。人間、生き物、命, 自然も生きていた。
黒い波の刺舌、家を、車を、畑を、あっという間に舐め尽くした。何が起こっているのだろう。
分けもなく、時が迫り、。。。。
. . . . . 忘れてはならない日、
今日は、復興を祈って, 数学日記を作る。
謙虚に、数学の女神に、頼んでみる。
役に立つものが、できてほしい。ありがとう。

*トピック

清宮の定理の周辺

* 幾何と代数新作問題

解説　点線円幾何学　HI-290

素数利用

五行歌　俳句

題　波

*新作　式とグラフ（EQG）

花を捧げる

連載

Doval 幾何学入門

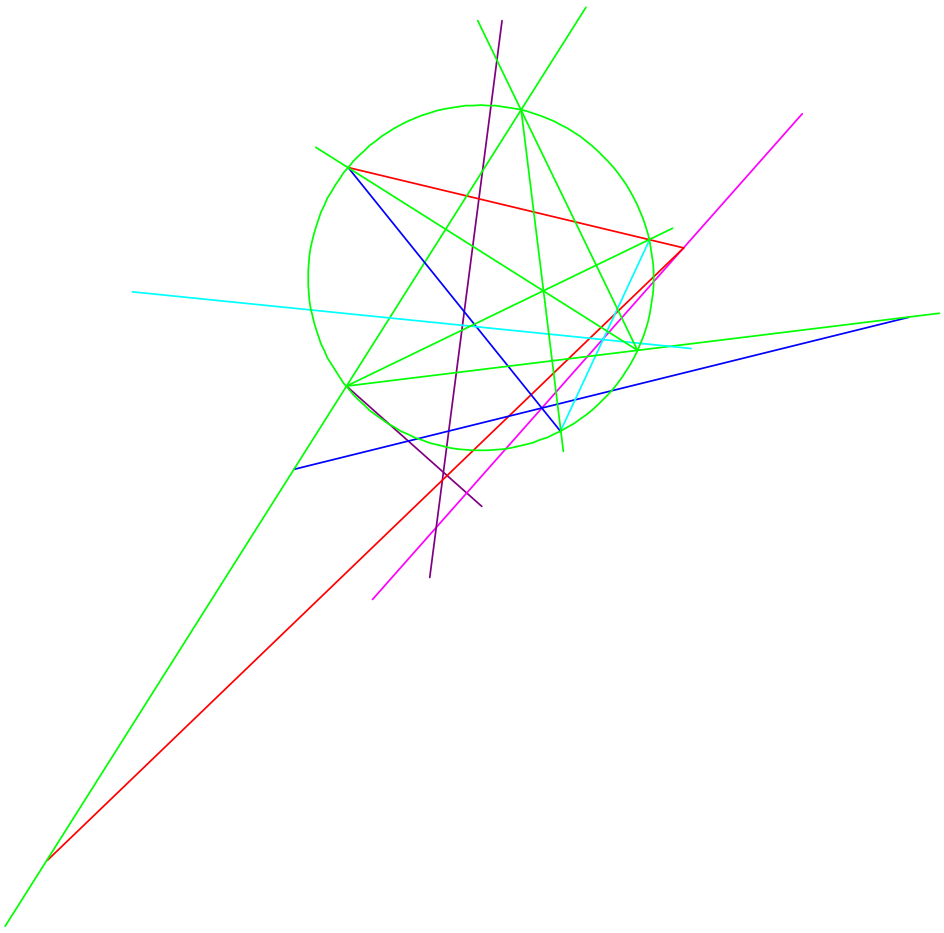
第 3 焦点

2012-3-11

今日のトピック

シムソン線の清宮の拡張定理の周辺

三角形に交わる直線と,外接円上の3点があったとき,その3組の各2点の清宮線とその2点を結ぶ線の交点3点は、一直線上にある。



解説　点線円幾何学

HI-290

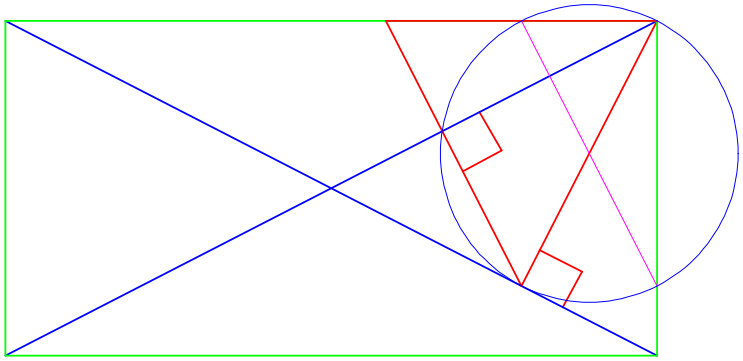
簡単な構造

平行線の出てきた.ありがとう。

2等辺三角形

HI-290

2008-8-19



蛭子井博孝

```
> # Prime Prime by H.E:
> s := 0 :for n from 1 to 100 do x := ithprime(n) : s := s + x : if isprime(s)
    then print("Prime  sum =Prime", n, Komemade, PRIME = s) fi:od:
                    "Prime  sum =Prime", 1, Komemade, PRIME = 2
                    "Prime  sum =Prime", 2, Komemade, PRIME = 5
                    "Prime  sum =Prime", 4, Komemade, PRIME = 17
                    "Prime  sum =Prime", 6, Komemade, PRIME = 41
                   "Prime  sum =Prime", 12, Komemade, PRIME = 197
                   "Prime  sum =Prime", 14, Komemade, PRIME = 281
                  "Prime  sum =Prime", 60, Komemade, PRIME = 7699
                  "Prime  sum =Prime", 64, Komemade, PRIME = 8893
                 "Prime  sum =Prime", 96, Komemade, PRIME = 22039
                "Prime  sum =Prime", 100, Komemade, PRIME = 24133        (1)
>
```

リフレッシュコーナー
　　俳句と五行歌

巡り来る春や静かに　波寄せる

頭より、波頭が上や　あの日海

寂しさや　波にさらわれ　早一年

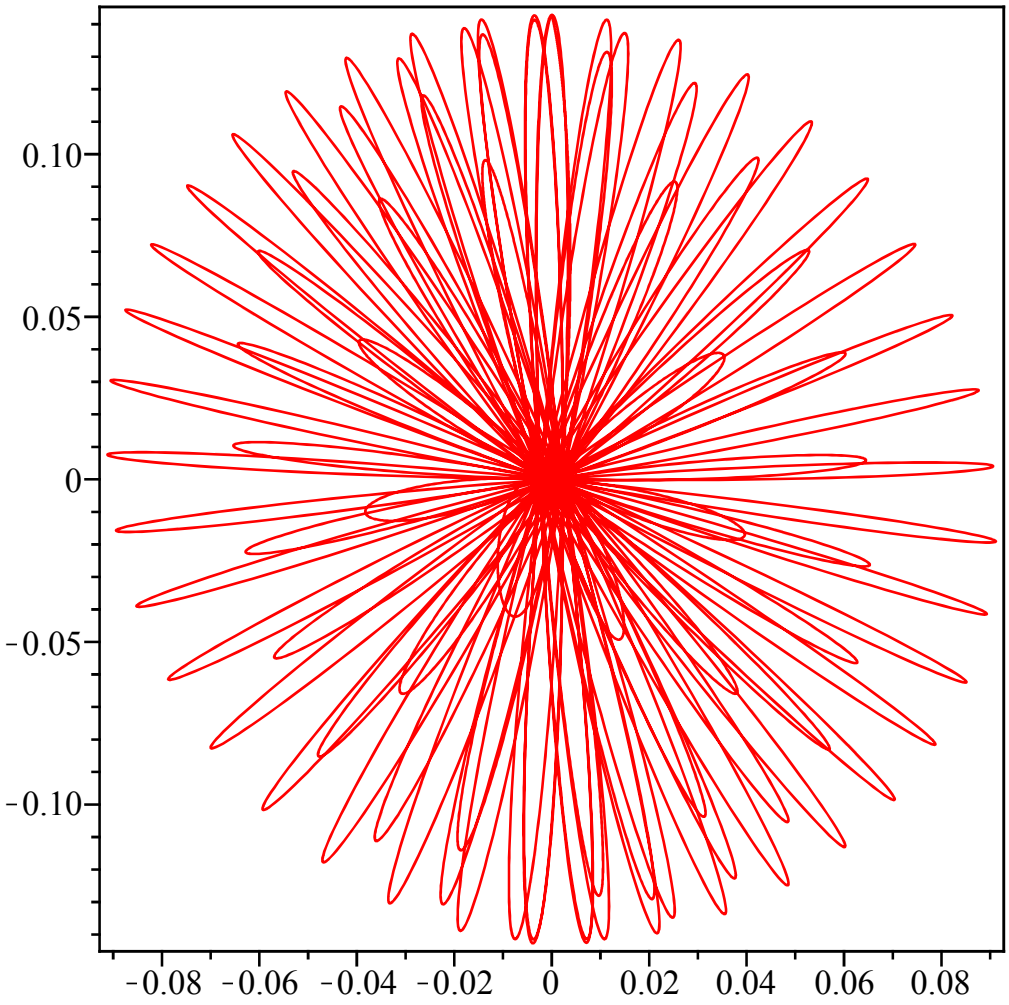
今日は
町に出た
時間が過ぎ
多弁の花が
一輪咲いた

ああ、あの日
すべてを飲み込んだ
大津波は、
今も、脳裏に残っている
衝撃が走った光景が、

弧庵

```
> # Prime EQG by H.E:
> with(plots) : with(StringTools) : HITL := FormatTime("%Y-%m-%d-(%r)");
>
```

$$> X := \frac{diff\left(\prod_{k=1}^{2} \frac{\sin(ithprime(k^k)\cdot t^k)}{ithprime(k+3)}, t\right)}{11} : Y := 11\cdot\left(\prod_{k=1}^{2} \frac{\cos(ithprime(k^k)\cdot t^k)}{ithprime(k+3)}\right) : HEQG := [X, Y, t=0..2\cdot Pi] : print(plot(HEQG, numpoints=10000, axes=box)) : print(EQ = [X, Y],) :$$



$$EQ = \left[\frac{2}{847}\cos(2t)\sin(7t^2) + \frac{2}{121}\sin(2t)\cos(7t^2)\,t,\ \frac{1}{7}\cos(2t)\cos(7t^2)\right] \quad (1)$$

$$> c := 0 : s := 0 : \textbf{for } n \textbf{ from } 1 \textbf{ to } 11 \textbf{ do } x := ithprime(n) : \textbf{for } m \textbf{ from } 1 \textbf{ to } 3 \textbf{ do } c := c+1 : y := ithprime(m) : X := \sum_{k=0}^{11} x^k : Y := \sum_{k=0}^{3} y^k : z := X \bmod Y : \textbf{if } z=0 \textbf{ then } s := s+1 : print([s, c], [N=n, M=m], [x, y], [X, MOD, Y]=z) \textbf{ fi:od:od:}$$

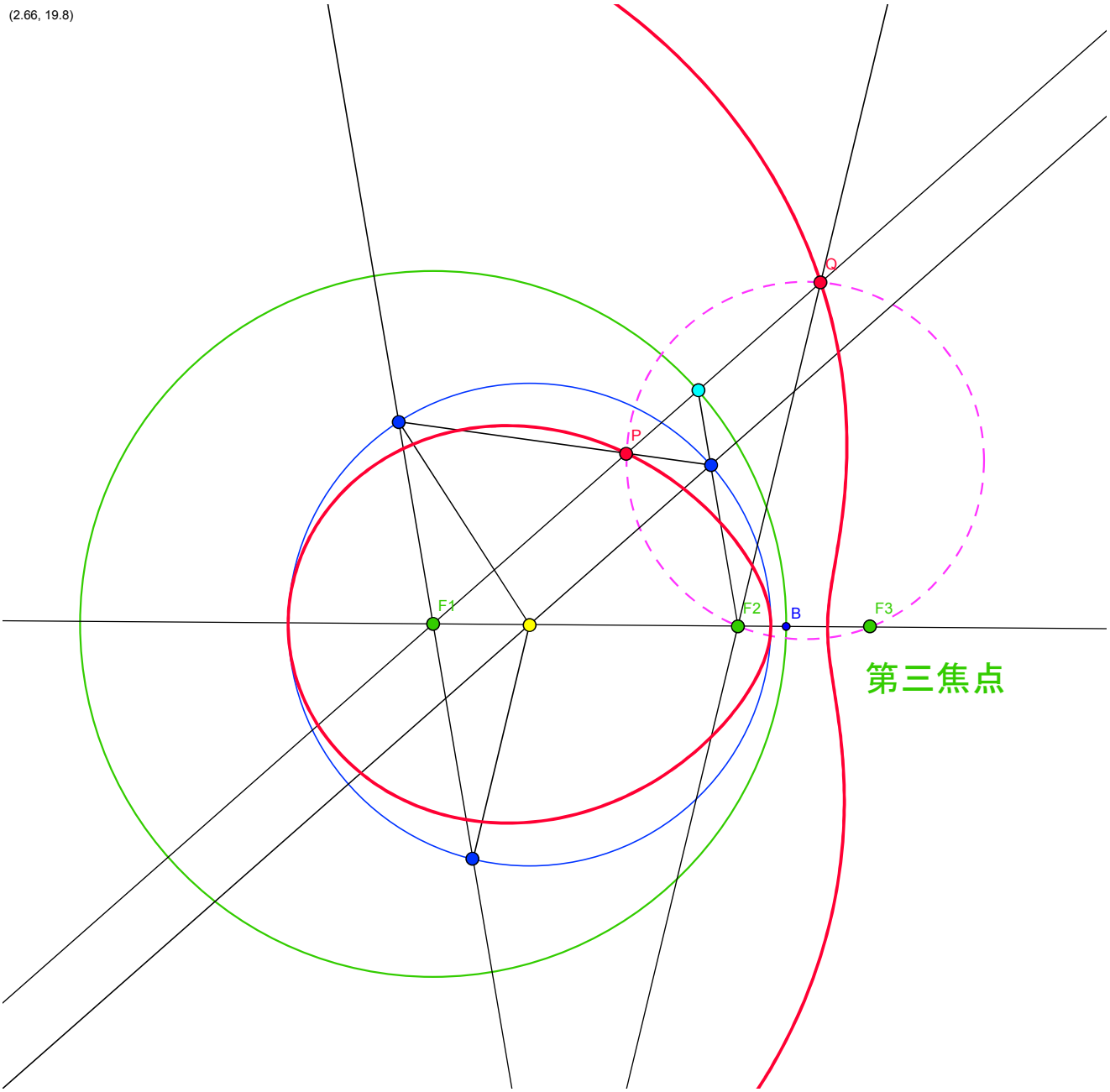
$$[1, 1], [N=1, M=1], [2, 2], [4095, MOD, 15]=0$$
$$[2, 5], [N=2, M=2], [3, 3], [265720, MOD, 40]=0$$
$$[3, 9], [N=3, M=3], [5, 5], [61035156, MOD, 156]=0$$
$$[4, 10], [N=4, M=1], [7, 2], [2306881200, MOD, 15]=0$$
$$[5, 11], [N=4, M=2], [7, 3], [2306881200, MOD, 40]=0$$
$$[6, 12], [N=4, M=3], [7, 5], [2306881200, MOD, 156]=0$$

$$[7, 15], [N=5, M=3], [11, 5], [313842837672, MOD, 156]=0$$
$$[8, 16], [N=6, M=1], [13, 2], [1941507093540, MOD, 15]=0$$
$$[9, 19], [N=7, M=1], [17, 2], [36413889826860, MOD, 15]=0$$
$$[10, 21], [N=7, M=3], [17, 5], [36413889826860, MOD, 156]=0$$
$$[11, 22], [N=8, M=1], [19, 2], [122961939948120, MOD, 15]=0$$
$$[12, 23], [N=8, M=2], [19, 3], [122961939948120, MOD, 40]=0$$
$$[13, 24], [N=8, M=3], [19, 5], [122961939948120, MOD, 156]=0$$
$$[14, 25], [N=9, M=1], [23, 2], [996119292364560, MOD, 15]=0$$
$$[15, 26], [N=9, M=2], [23, 3], [996119292364560, MOD, 40]=0$$
$$[16, 27], [N=9, M=3], [23, 5], [996119292364560, MOD, 156]=0$$
$$[17, 28], [N=10, M=1], [29, 2], [12636242257338180, MOD, 15]=0$$
$$[18, 30], [N=10, M=3], [29, 5], [12636242257338180, MOD, 156]=0$$
$$[19, 33], [N=11, M=3], [31, 5], [26255426126284992, MOD, 156]=0 \quad \textbf{(2)}$$

>

第三焦点　求め方　破線円を描く

H.Ebisui - 2012/03/11



数学日記

愛と理想

蛭子井博孝編著

第５日

数表作り

数表は、予想を含んでいる。

どんな予想が成り立つのか

数表を見て、考えることができる

ありがたい

*トピック

クリフォードの定理の周辺

* 幾何と代数新作問題

解説　　点線円幾何学　HI-312

数表 2 個

五行歌　俳句

題　雪

*新作　式とグラフ（EQG）

動物

連載

Doval 幾何学入門

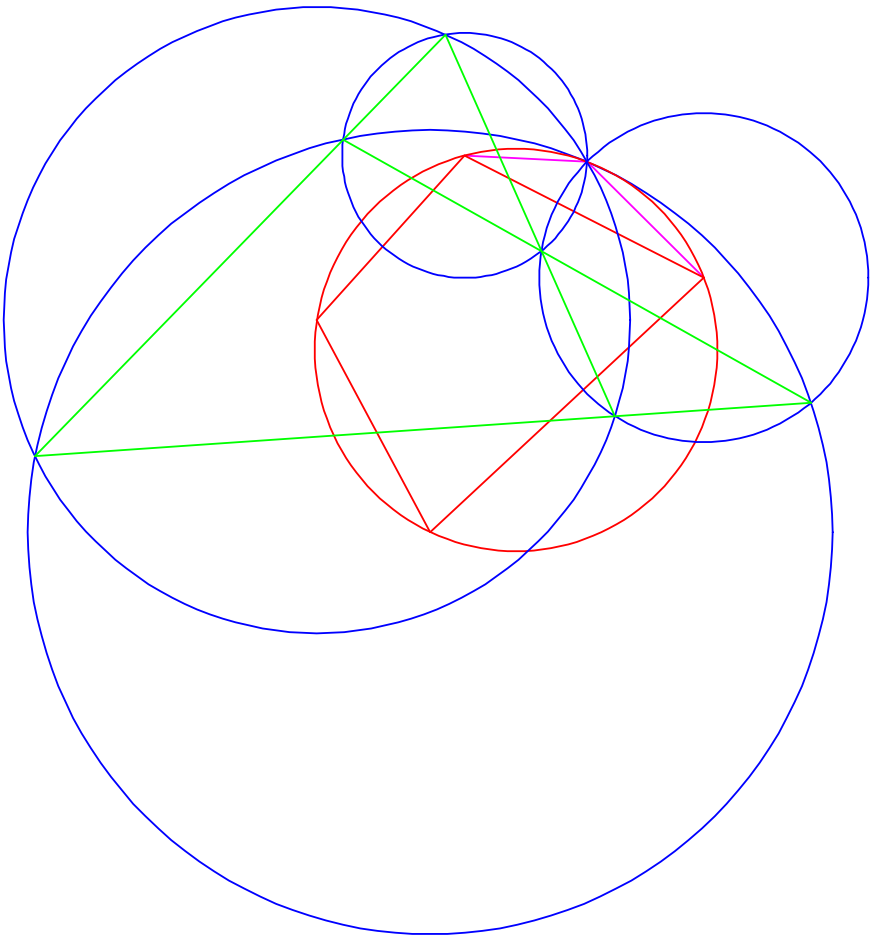
第 3 焦点　第二作図法

2012-3-12

今日のトピック

クリフォードの定理周辺

2012-3-12



蛭子井博孝

解説　点線円幾何学

HI-312

簡単な構造

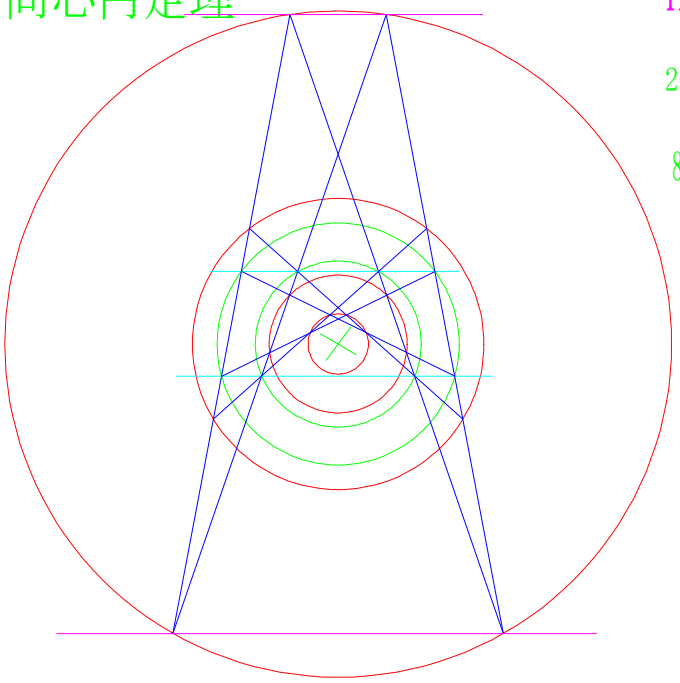
平行線の出てきた.ありがとう。

同心円の同心円定理

HI-312

2008-9-20

8 (6) =24 (2)



蛭子井博孝

```
> # Prime  Prime by H.E HITL:="2012-03-11-(11:48:16 PM)":
> with(StringTools) : HITL := FormatTime("%Y-%m-%d-(%r)");
                        HITL := "2012-03-12-(12:51:25 AM)"                    (1)
> for k from 1 to 100 do print("自然数", k, "jou  sum", N, Komemade, PRIME, hakkenNo
    = 0) : s := 0 : c := 0 :for n from 1 to 100 do x := n : s := s + x^k : if isprime(s) then c
    := c + 1 : print(n, Komemade, s = Prime, hakkenNo = c) fi:od:od:
                "自然数", 1, "jou  sum", N, Komemade, PRIME, hakkenNo = 0
                          2, Komemade, 3 = Prime, hakkenNo = 1
                "自然数", 2, "jou  sum", N, Komemade, PRIME, hakkenNo = 0
                          2, Komemade, 5 = Prime, hakkenNo = 1
                "自然数", 3, "jou  sum", N, Komemade, PRIME, hakkenNo = 0
                "自然数", 4, "jou  sum", N, Komemade, PRIME, hakkenNo = 0
                          2, Komemade, 17 = Prime, hakkenNo = 1
                "自然数", 5, "jou  sum", N, Komemade, PRIME, hakkenNo = 0
                "自然数", 6, "jou  sum", N, Komemade, PRIME, hakkenNo = 0
                "自然数", 7, "jou  sum", N, Komemade, PRIME, hakkenNo = 0
                "自然数", 8, "jou  sum", N, Komemade, PRIME, hakkenNo = 0
                          2, Komemade, 257 = Prime, hakkenNo = 1
                "自然数", 9, "jou  sum", N, Komemade, PRIME, hakkenNo = 0
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                          2, Komemade, 65537 = Prime, hakkenNo = 1
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```

"自然数", 36, "jou　sum", *N*, *Komemade*, *PRIME*, *hakkenNo* = 0
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"自然数", 96, "jou sum", *N*, *Komemade*, *PRIME*, *hakkenNo* = 0
"自然数", 97, "jou sum", *N*, *Komemade*, *PRIME*, *hakkenNo* = 0
"自然数", 98, "jou sum", *N*, *Komemade*, *PRIME*, *hakkenNo* = 0
"自然数", 99, "jou sum", *N*, *Komemade*, *PRIME*, *hakkenNo* = 0
"自然数", 100, "jou sum", *N*, *Komemade*, *PRIME*, *hakkenNo* = 0 **(2)**

> **for** *k* **from** 1 **to** 100 **do** *print*("奇数自然数", *k*, "jou sum", *N*, *Komemade*, *PRIME*, *hakkenNo* = 0) : *s* := 0 : *c* := 0 :**for** *n* **from** 1 **to** 100 **by** 2**do** *x* := *n* : *s* := *s* + x^k : **if** *isprime*(*s*) **then** *c* := *c* + 1 : *print*(*n*, *Komemade*, *s* = *Prime*, *hakkenNo* = *c*) **fi**:**od**:**od**:

"奇数自然数", 1, "jou sum", *N*, *Komemade*, *PRIME*, *hakkenNo* = 0
"奇数自然数", 2, "jou sum", *N*, *Komemade*, *PRIME*, *hakkenNo* = 0
"奇数自然数", 3, "jou sum", *N*, *Komemade*, *PRIME*, *hakkenNo* = 0
"奇数自然数", 4, "jou sum", *N*, *Komemade*, *PRIME*, *hakkenNo* = 0
"奇数自然数", 5, "jou sum", *N*, *Komemade*, *PRIME*, *hakkenNo* = 0
"奇数自然数", 6, "jou sum", *N*, *Komemade*, *PRIME*, *hakkenNo* = 0
"奇数自然数", 7, "jou sum", *N*, *Komemade*, *PRIME*, *hakkenNo* = 0
"奇数自然数", 8, "jou sum", *N*, *Komemade*, *PRIME*, *hakkenNo* = 0
"奇数自然数", 9, "jou sum", *N*, *Komemade*, *PRIME*, *hakkenNo* = 0
"奇数自然数", 10, "jou sum", *N*, *Komemade*, *PRIME*, *hakkenNo* = 0
"奇数自然数", 11, "jou sum", *N*, *Komemade*, *PRIME*, *hakkenNo* = 0
"奇数自然数", 12, "jou sum", *N*, *Komemade*, *PRIME*, *hakkenNo* = 0
5, *Komemade*, 244672067 = *Prime*, *hakkenNo* = 1
13, *Komemade*, 26733028994951 = *Prime*, *hakkenNo* = 2
"奇数自然数", 13, "jou sum", *N*, *Komemade*, *PRIME*, *hakkenNo* = 0
"奇数自然数", 14, "jou sum", *N*, *Komemade*, *PRIME*, *hakkenNo* = 0
"奇数自然数", 15, "jou sum", *N*, *Komemade*, *PRIME*, *hakkenNo* = 0
"奇数自然数", 16, "jou sum", *N*, *Komemade*, *PRIME*, *hakkenNo* = 0
"奇数自然数", 17, "jou sum", *N*, *Komemade*, *PRIME*, *hakkenNo* = 0
"奇数自然数", 18, "jou sum", *N*, *Komemade*, *PRIME*, *hakkenNo* = 0
"奇数自然数", 19, "jou sum", *N*, *Komemade*, *PRIME*, *hakkenNo* = 0
"奇数自然数", 20, "jou sum", *N*, *Komemade*, *PRIME*, *hakkenNo* = 0
"奇数自然数", 21, "jou sum", *N*, *Komemade*, *PRIME*, *hakkenNo* = 0

"奇数自然数", 22, "jou　sum", *N*, *Komemade*, *PRIME*, *hakkenNo* = 0
"奇数自然数", 23, "jou　sum", *N*, *Komemade*, *PRIME*, *hakkenNo* = 0
"奇数自然数", 24, "jou　sum", *N*, *Komemade*, *PRIME*, *hakkenNo* = 0
"奇数自然数", 25, "jou　sum", *N*, *Komemade*, *PRIME*, *hakkenNo* = 0
"奇数自然数", 26, "jou　sum", *N*, *Komemade*, *PRIME*, *hakkenNo* = 0
"奇数自然数", 27, "jou　sum", *N*, *Komemade*, *PRIME*, *hakkenNo* = 0
"奇数自然数", 28, "jou　sum", *N*, *Komemade*, *PRIME*, *hakkenNo* = 0
"奇数自然数", 29, "jou　sum", *N*, *Komemade*, *PRIME*, *hakkenNo* = 0
"奇数自然数", 30, "jou　sum", *N*, *Komemade*, *PRIME*, *hakkenNo* = 0
"奇数自然数", 31, "jou　sum", *N*, *Komemade*, *PRIME*, *hakkenNo* = 0
"奇数自然数", 32, "jou　sum", *N*, *Komemade*, *PRIME*, *hakkenNo* = 0
"奇数自然数", 33, "jou　sum", *N*, *Komemade*, *PRIME*, *hakkenNo* = 0
"奇数自然数", 34, "jou　sum", *N*, *Komemade*, *PRIME*, *hakkenNo* = 0
"奇数自然数", 35, "jou　sum", *N*, *Komemade*, *PRIME*, *hakkenNo* = 0
"奇数自然数", 36, "jou　sum", *N*, *Komemade*, *PRIME*, *hakkenNo* = 0
5, *Komemade*, 145519153784614871036397 47 = *Prime*, *hakkenNo* = 1
"奇数自然数", 37, "jou　sum", *N*, *Komemade*, *PRIME*, *hakkenNo* = 0
"奇数自然数", 38, "jou　sum", *N*, *Komemade*, *PRIME*, *hakkenNo* = 0
"奇数自然数", 39, "jou　sum", *N*, *Komemade*, *PRIME*, *hakkenNo* = 0
"奇数自然数", 40, "jou　sum", *N*, *Komemade*, *PRIME*, *hakkenNo* = 0
"奇数自然数", 41, "jou　sum", *N*, *Komemade*, *PRIME*, *hakkenNo* = 0
"奇数自然数", 42, "jou　sum", *N*, *Komemade*, *PRIME*, *hakkenNo* = 0
"奇数自然数", 43, "jou　sum", *N*, *Komemade*, *PRIME*, *hakkenNo* = 0
"奇数自然数", 44, "jou　sum", *N*, *Komemade*, *PRIME*, *hakkenNo* = 0
"奇数自然数", 45, "jou　sum", *N*, *Komemade*, *PRIME*, *hakkenNo* = 0
"奇数自然数", 46, "jou　sum", *N*, *Komemade*, *PRIME*, *hakkenNo* = 0
"奇数自然数", 47, "jou　sum", *N*, *Komemade*, *PRIME*, *hakkenNo* = 0
"奇数自然数", 48, "jou　sum", *N*, *Komemade*, *PRIME*, *hakkenNo* = 0
5, *Komemade*, 3552713678880267372432493847753987 = *Prime*, *hakkenNo* = 1
"奇数自然数", 49, "jou　sum", *N*, *Komemade*, *PRIME*, *hakkenNo* = 0
"奇数自然数", 50, "jou　sum", *N*, *Komemade*, *PRIME*, *hakkenNo* = 0
"奇数自然数", 51, "jou　sum", *N*, *Komemade*, *PRIME*, *hakkenNo* = 0
"奇数自然数", 52, "jou　sum", *N*, *Komemade*, *PRIME*, *hakkenNo* = 0
"奇数自然数", 53, "jou　sum", *N*, *Komemade*, *PRIME*, *hakkenNo* = 0
"奇数自然数", 54, "jou　sum", *N*, *Komemade*, *PRIME*, *hakkenNo* = 0
"奇数自然数", 55, "jou　sum", *N*, *Komemade*, *PRIME*, *hakkenNo* = 0
"奇数自然数", 56, "jou　sum", *N*, *Komemade*, *PRIME*, *hakkenNo* = 0
"奇数自然数", 57, "jou　sum", *N*, *Komemade*, *PRIME*, *hakkenNo* = 0
"奇数自然数", 58, "jou　sum", *N*, *Komemade*, *PRIME*, *hakkenNo* = 0
"奇数自然数", 59, "jou　sum", *N*, *Komemade*, *PRIME*, *hakkenNo* = 0
"奇数自然数", 60, "jou　sum", *N*, *Komemade*, *PRIME*, *hakkenNo* = 0
"奇数自然数", 61, "jou　sum", *N*, *Komemade*, *PRIME*, *hakkenNo* = 0
"奇数自然数", 62, "jou　sum", *N*, *Komemade*, *PRIME*, *hakkenNo* = 0
"奇数自然数", 63, "jou　sum", *N*, *Komemade*, *PRIME*, *hakkenNo* = 0
"奇数自然数", 64, "jou　sum", *N*, *Komemade*, *PRIME*, *hakkenNo* = 0

"奇数自然数", 65, "jou sum", *N*, *Komemade*, *PRIME*, *hakkenNo* = 0
"奇数自然数", 66, "jou sum", *N*, *Komemade*, *PRIME*, *hakkenNo* = 0
"奇数自然数", 67, "jou sum", *N*, *Komemade*, *PRIME*, *hakkenNo* = 0
"奇数自然数", 68, "jou sum", *N*, *Komemade*, *PRIME*, *hakkenNo* = 0
"奇数自然数", 69, "jou sum", *N*, *Komemade*, *PRIME*, *hakkenNo* = 0
"奇数自然数", 70, "jou sum", *N*, *Komemade*, *PRIME*, *hakkenNo* = 0
"奇数自然数", 71, "jou sum", *N*, *Komemade*, *PRIME*, *hakkenNo* = 0
"奇数自然数", 72, "jou sum", *N*, *Komemade*, *PRIME*, *hakkenNo* = 0

5, *Komemade*, 211758236813575107295480170109084902352995775163267 = *Prime*, *hakkenNo* = 1

"奇数自然数", 73, "jou sum", *N*, *Komemade*, *PRIME*, *hakkenNo* = 0
"奇数自然数", 74, "jou sum", *N*, *Komemade*, *PRIME*, *hakkenNo* = 0
"奇数自然数", 75, "jou sum", *N*, *Komemade*, *PRIME*, *hakkenNo* = 0
"奇数自然数", 76, "jou sum", *N*, *Komemade*, *PRIME*, *hakkenNo* = 0
"奇数自然数", 77, "jou sum", *N*, *Komemade*, *PRIME*, *hakkenNo* = 0
"奇数自然数", 78, "jou sum", *N*, *Komemade*, *PRIME*, *hakkenNo* = 0
"奇数自然数", 79, "jou sum", *N*, *Komemade*, *PRIME*, *hakkenNo* = 0
"奇数自然数", 80, "jou sum", *N*, *Komemade*, *PRIME*, *hakkenNo* = 0
"奇数自然数", 81, "jou sum", *N*, *Komemade*, *PRIME*, *hakkenNo* = 0
"奇数自然数", 82, "jou sum", *N*, *Komemade*, *PRIME*, *hakkenNo* = 0
"奇数自然数", 83, "jou sum", *N*, *Komemade*, *PRIME*, *hakkenNo* = 0
"奇数自然数", 84, "jou sum", *N*, *Komemade*, *PRIME*, *hakkenNo* = 0
"奇数自然数", 85, "jou sum", *N*, *Komemade*, *PRIME*, *hakkenNo* = 0
"奇数自然数", 86, "jou sum", *N*, *Komemade*, *PRIME*, *hakkenNo* = 0
"奇数自然数", 87, "jou sum", *N*, *Komemade*, *PRIME*, *hakkenNo* = 0
"奇数自然数", 88, "jou sum", *N*, *Komemade*, *PRIME*, *hakkenNo* = 0
"奇数自然数", 89, "jou sum", *N*, *Komemade*, *PRIME*, *hakkenNo* = 0
"奇数自然数", 90, "jou sum", *N*, *Komemade*, *PRIME*, *hakkenNo* = 0
"奇数自然数", 91, "jou sum", *N*, *Komemade*, *PRIME*, *hakkenNo* = 0
"奇数自然数", 92, "jou sum", *N*, *Komemade*, *PRIME*, *hakkenNo* = 0
"奇数自然数", 93, "jou sum", *N*, *Komemade*, *PRIME*, *hakkenNo* = 0
"奇数自然数", 94, "jou sum", *N*, *Komemade*, *PRIME*, *hakkenNo* = 0
"奇数自然数", 95, "jou sum", *N*, *Komemade*, *PRIME*, *hakkenNo* = 0
"奇数自然数", 96, "jou sum", *N*, *Komemade*, *PRIME*, *hakkenNo* = 0

13, *Komemade*,
868084233672462698662056743376387436160644561523996668018199210859789715809677227337313048412585887013795 91 = *Prime*, *hakkenNo* = 1

"奇数自然数", 97, "jou sum", *N*, *Komemade*, *PRIME*, *hakkenNo* = 0
"奇数自然数", 98, "jou sum", *N*, *Komemade*, *PRIME*, *hakkenNo* = 0
"奇数自然数", 99, "jou sum", *N*, *Komemade*, *PRIME*, *hakkenNo* = 0
"奇数自然数", 100, "jou sum", *N*, *Komemade*, *PRIME*, *hakkenNo* = 0　**(3)**

>

リフレッシュコーナー
　　俳句と五行歌

　雪降って　街灯霞む　日は遠し

雪解けて　滴がたてる　音響く

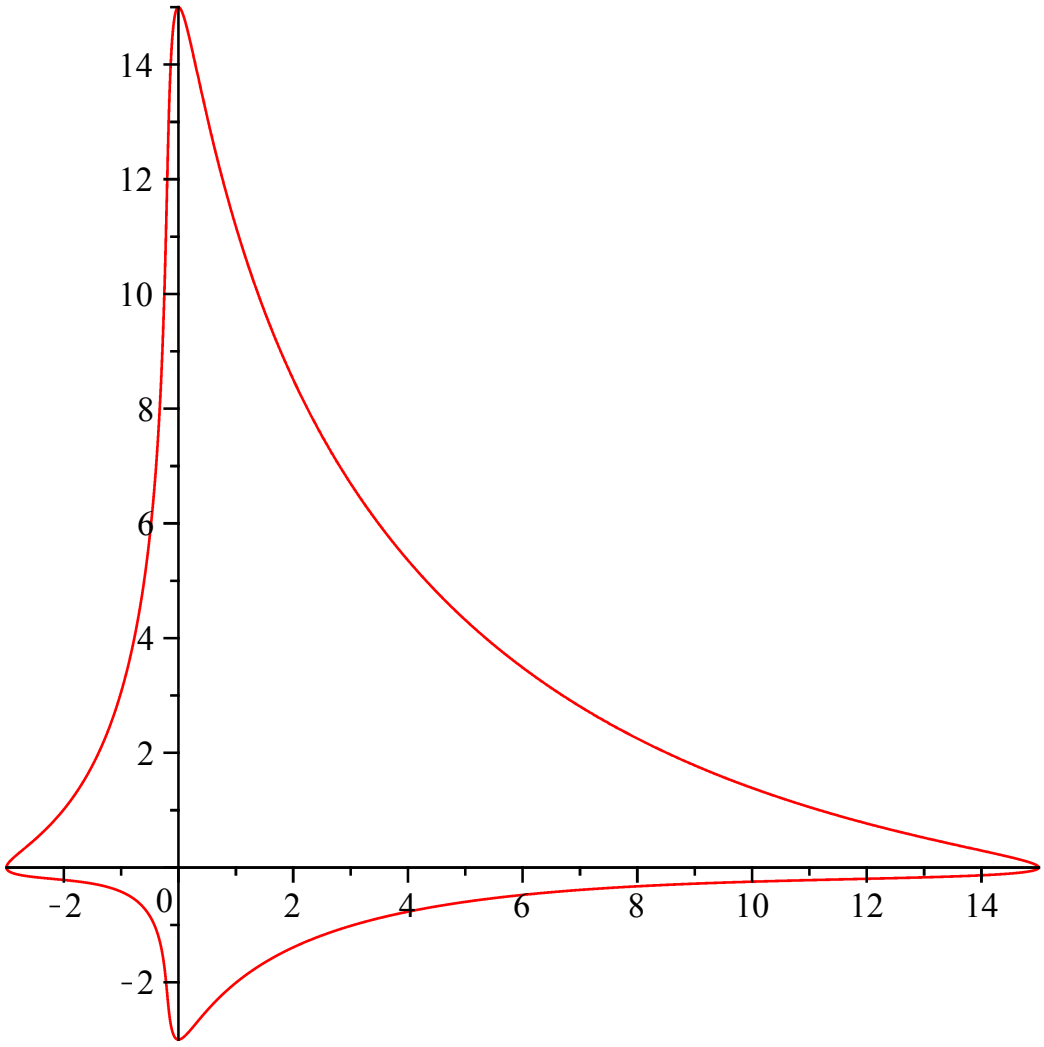
手のひらに　降りた雪の子　淡く消え

3 月
雪の降る
寒さ
心は、さらに
寂しく

雪が、ふぁらふぁらと舞う
今日も、町の中で
仕事
PC の
電池がなくなるまで

弧庵

```
> # sct EQG by H.E:
> with(plots):
> x := sum(k*sin(t)^k, k=1..5): y := sum(k*cos(t)^k, k=1..5): print(plot([x, y, t=0..2*Pi], numpoints=10000)):
  print(EQ=[x, y]):
```

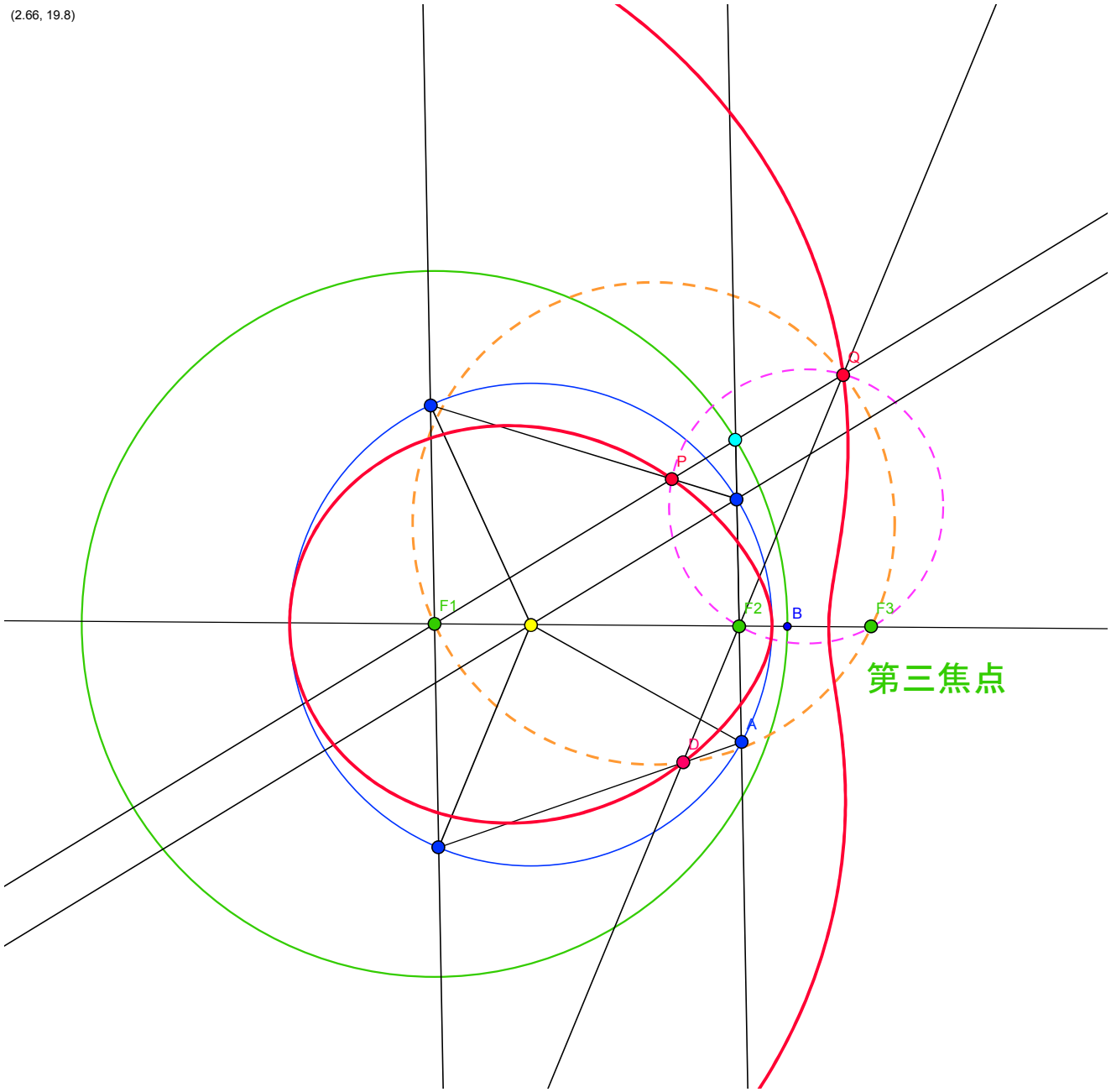


$$EQ = [\sin(t) + 2\sin(t)^2 + 3\sin(t)^3 + 4\sin(t)^4 + 5\sin(t)^5, \cos(t) + 2\cos(t)^2 + 3\cos(t)^3 + 4\cos(t)^4 + 5\cos(t)^5] \quad (1)$$

```
>
>
```

第三焦点　求め方　破線円を描く

H.Ebisui - 2012/03/12



数学日記

愛と理想

蛭子井博孝編著

第６日

Doval 見込み角の定理が、簡単に作図できる
私が、以前見つけた定理。思い出すだけでも
涙。図学会誌に、証明論文を書いた。
あのとき、Geogebra があったら、
ああ、時代の進歩ありがたくて涙が出る

*トピック

ナポレオンの定理の周辺

* 幾何と代数新作問題

解説　　点線円幾何学　HI-306

数表 2 個

五行歌　俳句

題　菜の花

*新作　式とグラフ（EQG）

int　int　らせん

連載

Doval 幾何学入門

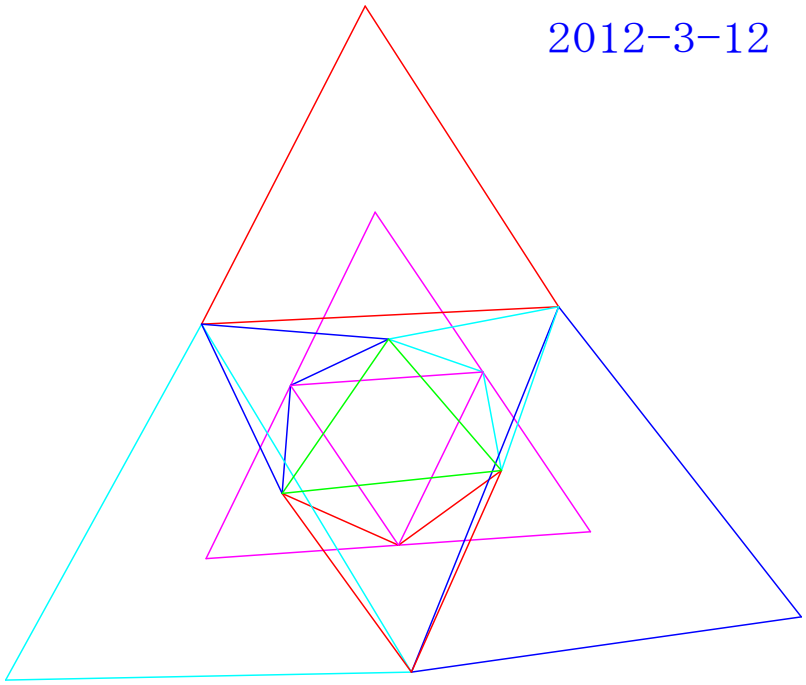
第 3 焦点　第３作図法　見込み角の定理利用

2012-3-13

今日のトピック

ナポレオンの正三角形の定理の周辺

2012-3-12



蛭子井博孝

```
> # H乗数の発見 by H.E:
> cc := 0 :for h from 2 to 8 do for e from 2 to 5
    doprint("奇数xのE乗数の和がH乗数になる時", E = e, H = h) : for k from 1 to 100
    by 2 do s := 0 : c := 0 :for x from k to 100 by 2 do  s := s + x^e : if s ≠ 1 and s
    = floor(evalf(s^(1/h)))^h  then if k ≠ x then c := c + 1 : cc := cc + 1 : print(K = k, X
    = x, E = e, "KからXまでE乗数の和", S = s, N = s^(1/h), sN = simplify(s^(1/h)), hakkkenNo
    = c)fi:fi:od:  if c ≠ 0 then print(hakken kosu = c, Sohakkensu = cc)fi:od:od:od:
```

"奇数xのE乗数の和がH乗数になる時", $E = 2$, $H = 2$

$K = 27$, $X = 57$, $E = 2$, "KからXまでE乗数の和", $S = 29584$, $N = \sqrt{29584}$, $sN = 172$, $hakkkenNo = 1$

$K = 27$, $X = 75$, $E = 2$, "KからXまでE乗数の和", $S = 70225$, $N = \sqrt{70225}$, $sN = 265$, $hakkkenNo = 2$

$hakken\ kosu = 2$, $Sohakkensu = 2$

"奇数xのE乗数の和がH乗数になる時", $E = 3$, $H = 2$

$K = 1$, $X = 9$, $E = 3$, "KからXまでE乗数の和", $S = 1225$, $N = \sqrt{1225}$, $sN = 35$, $hakkkenNo = 1$

$K = 1$, $X = 57$, $E = 3$, "KからXまでE乗数の和", $S = 1413721$, $N = \sqrt{1413721}$, $sN = 1189$, $hakkkenNo = 2$

$hakken\ kosu = 2$, $Sohakkensu = 4$

$K = 5$, $X = 15$, $E = 3$, "KからXまでE乗数の和", $S = 8100$, $N = \sqrt{8100}$, $sN = 90$, $hakkkenNo = 1$

$hakken\ kosu = 1$, $Sohakkensu = 5$

$K = 25$, $X = 73$, $E = 3$, "KからXまでE乗数の和", $S = 3705625$, $N = \sqrt{3705625}$, $sN = 1925$, $hakkkenNo = 1$

$hakken\ kosu = 1$, $Sohakkensu = 6$

"奇数xのE乗数の和がH乗数になる時", $E = 4$, $H = 2$

"奇数xのE乗数の和がH乗数になる時", $E = 5$, $H = 2$

"奇数xのE乗数の和がH乗数になる時", $E = 2$, $H = 3$

$K = 19$, $X = 23$, $E = 2$, "KからXまでE乗数の和", $S = 1331$, $N = 1331^{1/3}$, $sN = 11$, $hakkkenNo = 1$

$hakken\ kosu = 1$, $Sohakkensu = 7$

"奇数xのE乗数の和がH乗数になる時", $E = 3$, $H = 3$

$K = 31$, $X = 41$, $E = 3$, "KからXまでE乗数の和", $S = 287496$, $N = 287496^{1/3}$, $sN = 66$, $hakkkenNo = 1$

$hakken\ kosu = 1$, $Sohakkensu = 8$

"奇数xのE乗数の和がH乗数になる時", $E = 4$, $H = 3$

"奇数xのE乗数の和がH乗数になる時", $E = 5$, $H = 3$

"奇数xのE乗数の和がH乗数になる時", $E = 2$, $H = 4$

"奇数xのE乗数の和がH乗数になる時", $E = 3$, $H = 4$

"奇数xのE乗数の和がH乗数になる時", $E = 4$, $H = 4$

"奇数xのE乗数の和がH乗数になる時", $E = 5$, $H = 4$

"奇数xのE乗数の和がH乗数になる時", $E=2, H=5$
"奇数xのE乗数の和がH乗数になる時", $E=3, H=5$
"奇数xのE乗数の和がH乗数になる時", $E=4, H=5$
"奇数xのE乗数の和がH乗数になる時", $E=5, H=5$
"奇数xのE乗数の和がH乗数になる時", $E=2, H=6$
"奇数xのE乗数の和がH乗数になる時", $E=3, H=6$
"奇数xのE乗数の和がH乗数になる時", $E=4, H=6$
"奇数xのE乗数の和がH乗数になる時", $E=5, H=6$
"奇数xのE乗数の和がH乗数になる時", $E=2, H=7$
"奇数xのE乗数の和がH乗数になる時", $E=3, H=7$
"奇数xのE乗数の和がH乗数になる時", $E=4, H=7$
"奇数xのE乗数の和がH乗数になる時", $E=5, H=7$
"奇数xのE乗数の和がH乗数になる時", $E=2, H=8$
"奇数xのE乗数の和がH乗数になる時", $E=3, H=8$
"奇数xのE乗数の和がH乗数になる時", $E=4, H=8$
"奇数xのE乗数の和がH乗数になる時", $E=5, H=8$ **(1)**

```
> ? break;
>
```

```
> # H乗数の発見 by H.E:
> cc := 0 :for h from 2 to 8 do for e from 2
    to 5 doprint("xのE乗数の和がH乗数になる時", E = e, H = h) : for k from 1 to 500
    do s := 0 : c := 0 :for x from 1 to k do s := s + x^k : if s ≠ 1 and s
    = floor(evalf(s^(1/h)))^h then if k ≠ x then c := c + 1 : cc := cc + 1 : print(K = k, X
    = x, E = e, "K番目からX番目までE乗数の和", S = s, N = s^(1/h), sN = simplify(s^(1/h)),
    hakkkenNo = c)fi:fi:od: if c ≠ 0 then print(hakken kosu = c, Sohakkensu = cc)fi:od:od:
    od:
```

"素数xのE乗数の和がH乗数になる時", $E = 2$, $H = 2$

$K = 13$, $X = 40$, $E = 2$, "K番目からX番目までE乗数の和", $S = 343396$, $N = \sqrt{343396}$, $sN = 586$, $hakkkenNo = 1$

$hakken\ kosu = 1$, $Sohakkensu = 1$

$K = 37$, $X = 184$, $E = 2$, "K番目からX番目までE乗数の和", $S = 66814276$, $N = \sqrt{66814276}$, $sN = 8174$, $hakkkenNo = 1$

$hakken\ kosu = 1$, $Sohakkensu = 2$

$K = 101$, $X = 164$, $E = 2$, "K番目からX番目までE乗数の和", $S = 37063744$, $N = \sqrt{37063744}$, $sN = 6088$, $hakkkenNo = 1$

$hakken\ kosu = 1$, $Sohakkensu = 3$

$K = 183$, $X = 255$, $E = 2$, "K番目からX番目までE乗数の和", $S = 137053849$, $N = \sqrt{137053849}$, $sN = 11707$, $hakkkenNo = 1$

$hakken\ kosu = 1$, $Sohakkensu = 4$

$K = 235$, $X = 283$, $E = 2$, "K番目からX番目までE乗数の和", $S = 134212225$, $N = \sqrt{134212225}$, $sN = 11585$, $hakkkenNo = 1$

$hakken\ kosu = 1$, $Sohakkensu = 5$

"素数xのE乗数の和がH乗数になる時", $E = 3$, $H = 2$
"素数xのE乗数の和がH乗数になる時", $E = 4$, $H = 2$
"素数xのE乗数の和がH乗数になる時", $E = 5$, $H = 2$
"素数xのE乗数の和がH乗数になる時", $E = 2$, $H = 3$
"素数xのE乗数の和がH乗数になる時", $E = 3$, $H = 3$
"素数xのE乗数の和がH乗数になる時", $E = 4$, $H = 3$
"素数xのE乗数の和がH乗数になる時", $E = 5$, $H = 3$
"素数xのE乗数の和がH乗数になる時", $E = 2$, $H = 4$
"素数xのE乗数の和がH乗数になる時", $E = 3$, $H = 4$
"素数xのE乗数の和がH乗数になる時", $E = 4$, $H = 4$
"素数xのE乗数の和がH乗数になる時", $E = 5$, $H = 4$
"素数xのE乗数の和がH乗数になる時", $E = 2$, $H = 5$
"素数xのE乗数の和がH乗数になる時", $E = 3$, $H = 5$
"素数xのE乗数の和がH乗数になる時", $E = 4$, $H = 5$
"素数xのE乗数の和がH乗数になる時", $E = 5$, $H = 5$
"素数xのE乗数の和がH乗数になる時", $E = 2$, $H = 6$
"素数xのE乗数の和がH乗数になる時", $E = 3$, $H = 6$
"素数xのE乗数の和がH乗数になる時", $E = 4$, $H = 6$

"素数xのE乗数の和がH乗数になる時", $E=5, H=6$
"素数xのE乗数の和がH乗数になる時", $E=2, H=7$
"素数xのE乗数の和がH乗数になる時", $E=3, H=7$
"素数xのE乗数の和がH乗数になる時", $E=4, H=7$
"素数xのE乗数の和がH乗数になる時", $E=5, H=7$
"素数xのE乗数の和がH乗数になる時", $E=2, H=8$
"素数xのE乗数の和がH乗数になる時", $E=3, H=8$
"素数xのE乗数の和がH乗数になる時", $E=4, H=8$
"素数xのE乗数の和がH乗数になる時", $E=5, H=8$ **(1)**

```
> ? break;
>
```

リフレッシュコーナー
俳句と五行歌

菜の花を　とってそえたや　無縁仏

菜の花の　南鹿児島　黄一面

菜種油で　一品作り　愛はこぶ

あれから、
人生は変わった
修学旅行
無縁古墳
ああ、幾世紀

我が人生
何でや
あかん
いや
そやさかい

弧庵

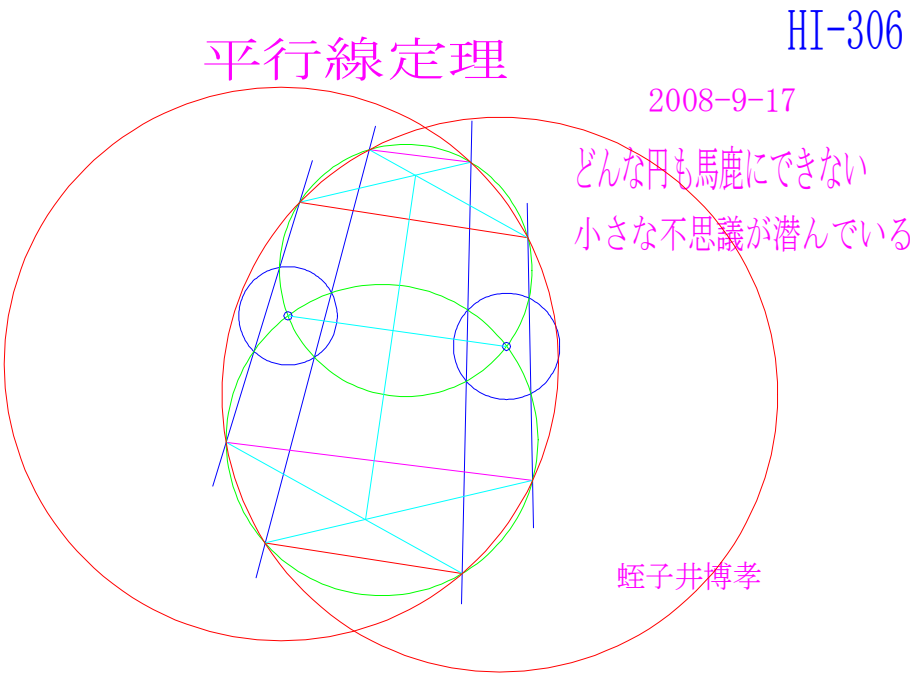
解説　点線円幾何学

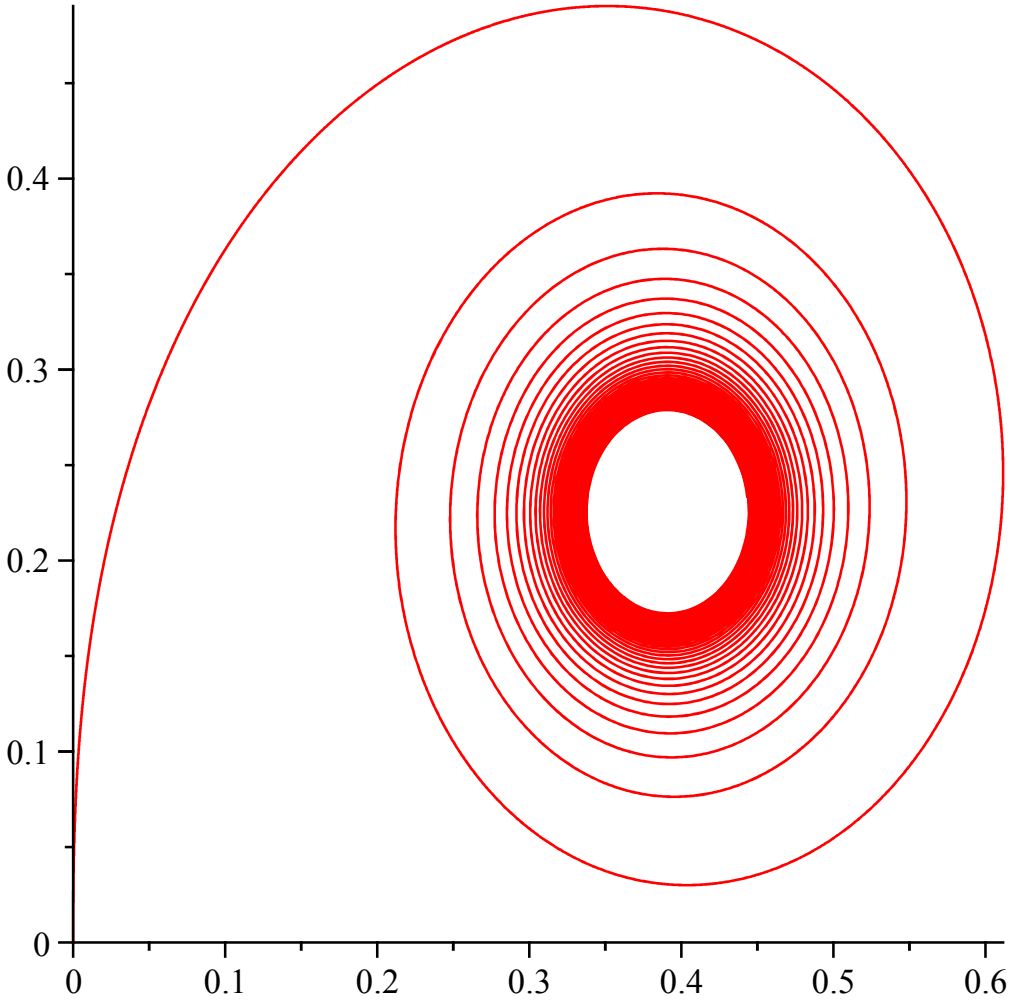
HI-306

簡単な構造

赤共円定理は、補助線を引き

　円周角　内接する四角形の定理から証明できるよ





$$[1,3],\ eq=\left[t\sin\left(t^3\right),\ t\cos\left(t^3\right),\ t=0\ldots 2\pi\right]$$

$$INT(eq),\ GEQ=\left[\frac{1}{6}\,2^{2/3}\sqrt{\pi}\left(\frac{3}{5}\,\frac{t^2\,2^{1/3}\sin\left(t^3\right)}{\sqrt{\pi}}\right.\right.$$

$$-\frac{3}{5}\,\frac{t^5\,2^{1/3}\sin\left(t^3\right)\ \mathrm{LommelS1}\left(\frac{7}{6},\frac{3}{2},t^3\right)}{\sqrt{\pi}\ \left(t^3\right)^{7/6}}$$

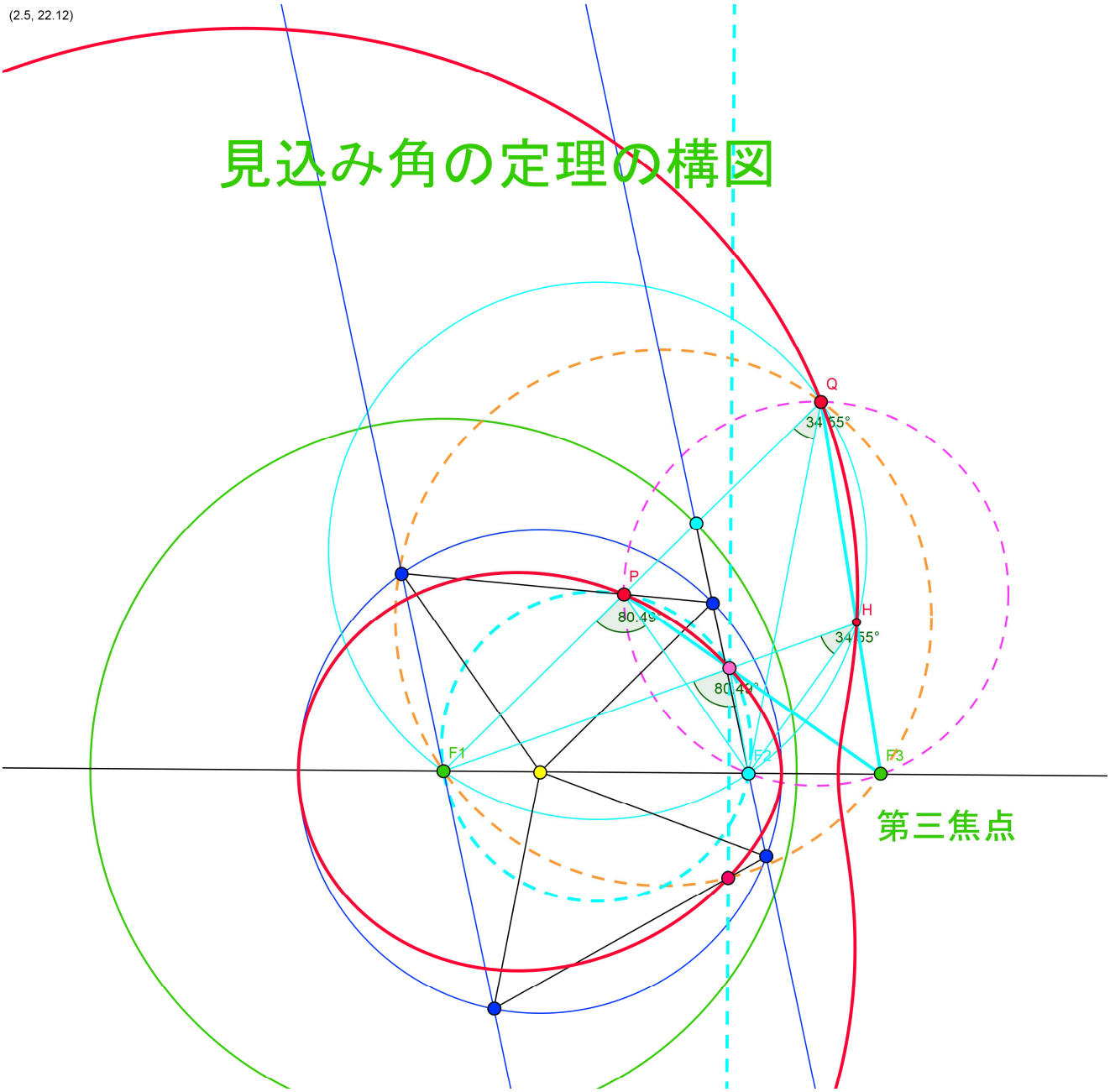
$$\left.\left.-\frac{t^5\,2^{1/3}\left(t^3\cos\left(t^3\right)-\sin\left(t^3\right)\right)\ \mathrm{LommelS1}\left(\frac{1}{6},\frac{1}{2},t^3\right)}{\sqrt{\pi}\ \left(t^3\right)^{13/6}}\right)\right],$$

$$\frac{1}{6}\,2^{2/3}\sqrt{\pi}\left(\frac{3}{2}\,\frac{2^{1/3}\sin\left(t^3\right)}{\sqrt{\pi}\,t}+\frac{3}{2}\,\frac{2^{1/3}\left(t^3\cos\left(t^3\right)-\sin\left(t^3\right)\right)}{\sqrt{\pi}\,t}\right.$$

$$\left.-\frac{1}{2}\,\frac{t^5\,2^{1/3}\sin\left(t^3\right)\ \mathrm{LommelS1}\left(\frac{1}{6},\frac{3}{2},t^3\right)}{\sqrt{\pi}\ \left(t^3\right)^{7/6}}\right)$$

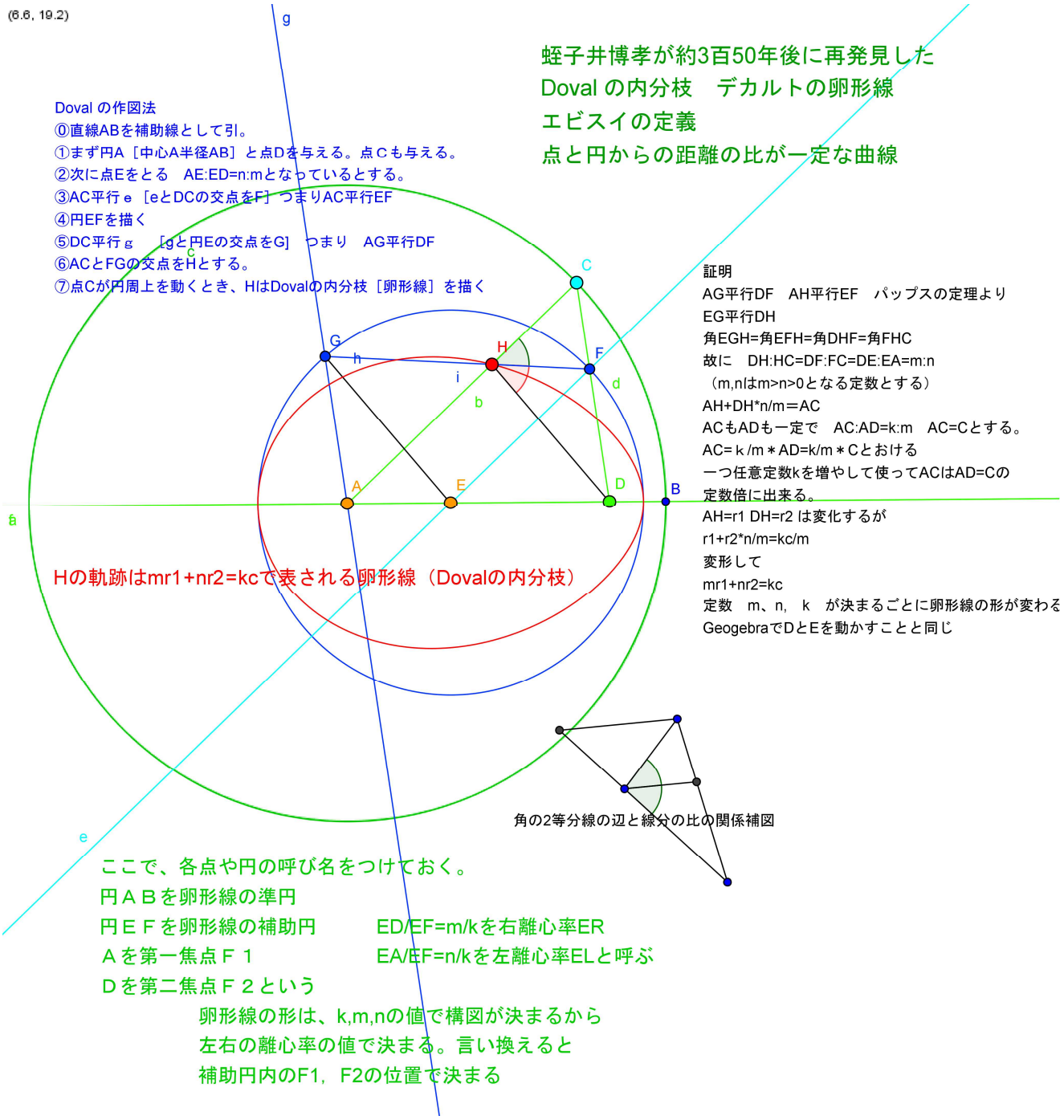
第三焦点　第三の求め方　水色線見込み角の定理の構図を使う。

H.Ebisui - 2012/03/13



Dovalの双極座標表示式

蛭子井博孝　740-0012 岩国市元町4丁目12-10　1950-04-20生まれ　0827-22-3305



蛭子井博孝が約3百50年後に再発見した
Doval の内分枝　デカルトの卵形線
エビスイの定義
点と円からの距離の比が一定な曲線

Doval の作図法
⓪直線ABを補助線として引。
①まず円A［中心A半径AB］と点Dを与える。点Ｃも与える。
②次に点Eをとる　AE:ED=n:mとなっているとする。
③AC平行ｅ［eとDCの交点をF］つまりAC平行EF
④円EFを描く
⑤DC平行ｇ　［gと円Eの交点をG］　つまり　AG平行DF
⑥ACとFGの交点をHとする。
⑦点Cが円周上を動くとき、HはDovalの内分枝［卵形線］を描く

証明
AG平行DF　AH平行EF　パップスの定理より
EG平行DH
角EGH=角EFH=角DHF=角FHC
故に　DH:HC=DF:FC=DE:EA=m:n
（m,nはm>n>0となる定数とする）
AH+DH*n/m＝AC
ACもADも一定で　AC:AD=k:m　AC=Cとする。
AC=ｋ/m＊AD=k/m＊Cとおける
一つ任意定数kを増やして使ってACはAD=Cの
定数倍に出来る。
AH=r1 DH=r2 は変化するが
r1+r2*n/m=kc/m
変形して
mr1+nr2=kc
定数　m、n,　k　が決まるごとに卵形線の形が変わる
GeogebraでDとEを動かすことと同じ

Hの軌跡はmr1+nr2=kcで表される卵形線（Dovalの内分枝）

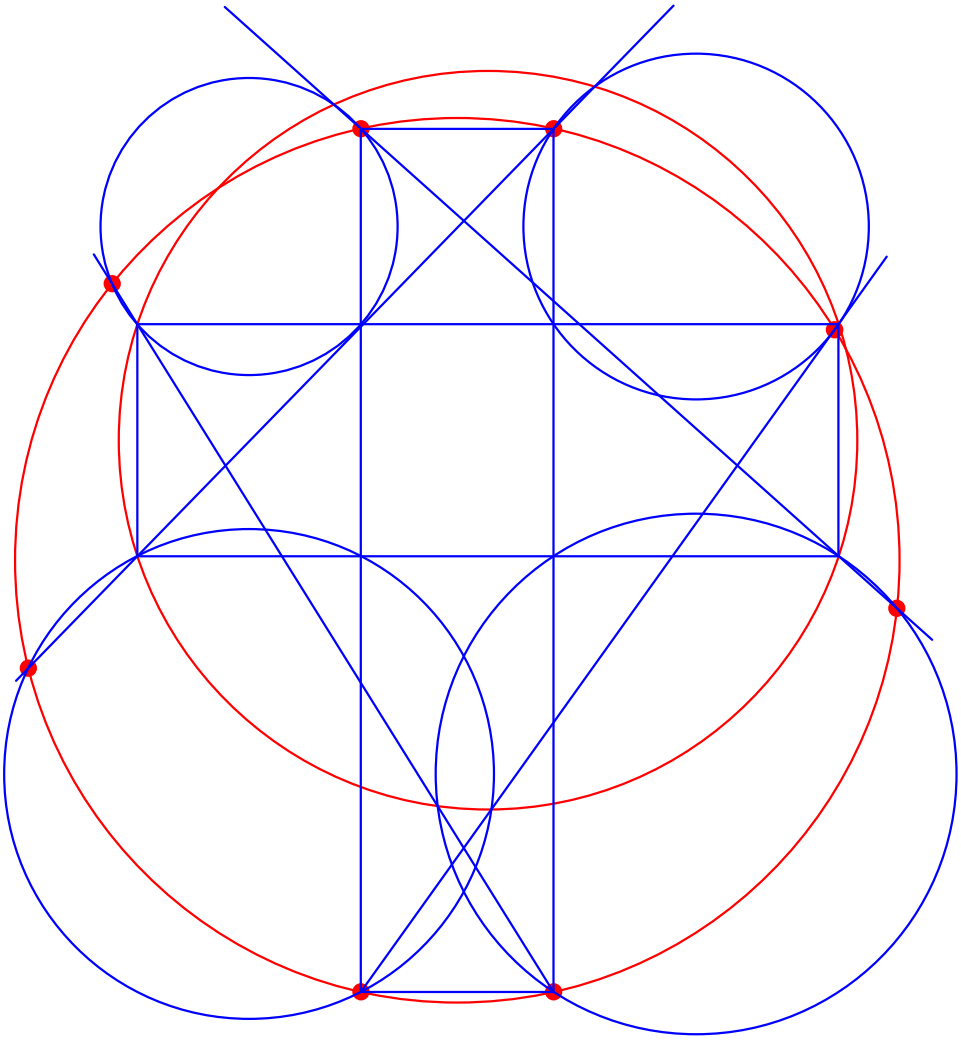
角の2等分線の辺と線分の比の関係補図

ここで、各点や円の呼び名をつけておく。
円ＡＢを卵形線の準円
円ＥＦを卵形線の補助円　　ED/EF=m/kを右離心率ER
Ａを第一焦点Ｆ１　　EA/EF=n/kを左離心率ELと呼ぶ
Ｄを第二焦点Ｆ２という

卵形線の形は、k,m,nの値で構図が決まるから
左右の離心率の値で決まる。言い換えると
補助円内のF1，F2の位置で決まる

ピタゴラス

ありがとう



(HEX61)

数学日記

愛　と　理想

蛭子井博孝編著

第７日

年をとり,高校数学から遠ざかり、その利用も、ままならぬ状態である。
たとえば、円に内接する四角形の４辺と対角線の長さが、すべて、10 までの自然数であるものは、どんな場合か。考えても、簡潔な結論が出ることでは、ない。一応、プログラムを組んでみて、テーブルに出してみたが、自信がない。それは、簡潔な結論を導けないからであろう。7 日間、トピックとして、数学の定理の周辺を見てきて、数学の定理が、完結したものではないことに気づき、何か、今までの数学観が変わってしまった。言い方を変えれば、ちょうど、結婚して、伴侶の実態を見て、人間の本質を見るように、数学の本質の一つが見えたように思う。とくに、今日のトピック、トレミーの定理の周辺が、私を変えた。数学の本質は、簡潔さの美しさにあるのではなく、つまり、簡潔な定義の発見や問題の解決が、より多くの物事の整理に、少しでも役立てば、いいのであり、物事の整理は、毎日毎日、　際限なく、変わった形で、行われ続けるのである。
数学とは、ものごとを整理する道具として存在し、数学をやることは、道具を作ること、使うこと、改良することである。
ちょうど、ものを数えて、全体を、個数として整理するように。
個々のものごとは、数学では、解決できないほど、いろいろのものや性質を含み持っているものである。数学という物事自身も。

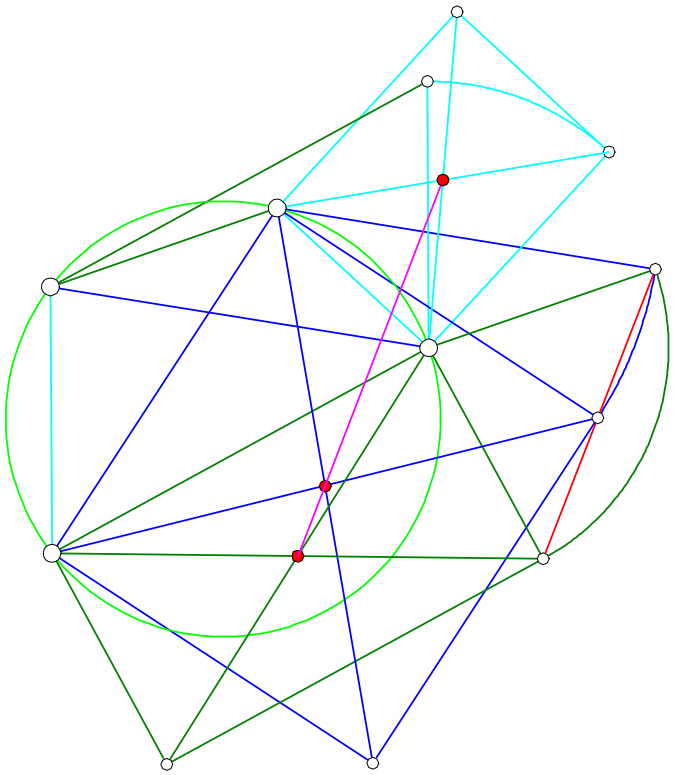
2012-3-14

トレミーの定理の周辺

円周上に内接する四角形の対角線の長さの積が、向かい合う辺の長さの積の和に等しい。

トレミーの定理の周辺

2012-3-13



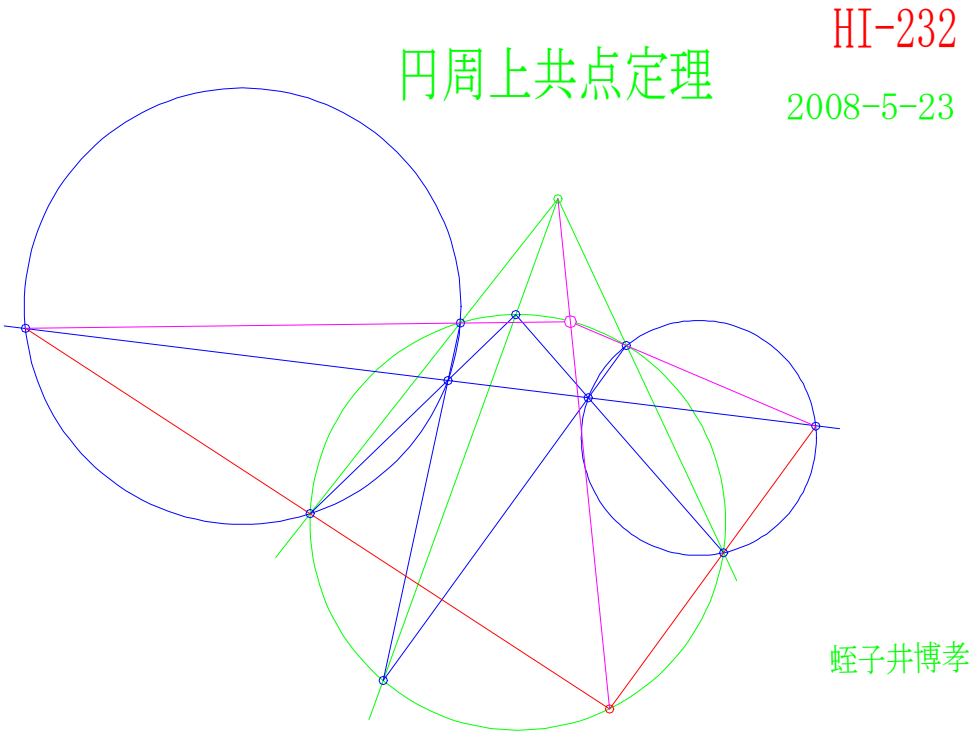
	面積[mm2]	1557.501
＋	面積[mm2]	2918.918
	面積[mm2]	4476.419

蛭子井博孝

解説　点線円幾何学

HI-232

円周上共点 2 つ　対称構造が現れている



$$Cnt=9,\ XY=[7,8],\ ABCD=[3,7,5,7]$$
$$No=7,\ [7,8],\ [3,8],\ [4,8]$$
$$No=8,\ [7,8],\ [4,4],\ [5,8]$$
$$No=9,\ [7,8],\ [4,5],\ [6,6]$$
$$No=10,\ [7,8],\ [4,6],\ [4,8]$$
$$Cnt=10,\ XY=[7,8],\ ABCD=[4,6,4,8]$$
$$No=11,\ [7,8],\ [4,7],\ [4,7]$$
$$Total=313$$
$$TBC=36,\ \text{" X*Y=A*B+C*D"}$$
$$[X,Y],\ [A,B],\ [C,\mathrm{D}]$$
$$No=1,\ [8,8],\ [1,8],\ [7,8]$$
$$No=2,\ [8,8],\ [2,4],\ [7,8]$$
$$No=3,\ [8,8],\ [2,8],\ [6,8]$$
$$No=4,\ [8,8],\ [3,5],\ [7,7]$$
$$Cnt=11,\ XY=[8,8],\ ABCD=[3,5,7,7]$$
$$No=5,\ [8,8],\ [3,8],\ [5,8]$$
$$No=6,\ [8,8],\ [4,4],\ [6,8]$$
$$Cnt=12,\ XY=[8,8],\ ABCD=[4,4,6,8]$$
$$No=7,\ [8,8],\ [4,6],\ [5,8]$$
$$No=8,\ [8,8],\ [4,7],\ [6,6]$$
$$Cnt=13,\ XY=[8,8],\ ABCD=[4,7,6,6]$$
$$No=9,\ [8,8],\ [4,8],\ [4,8]$$
$$Total=322$$
$$TOTAL=322 \quad \textbf{(2)}$$

```
> a := 4 :
> b := 4 :
>  :
> d := 8 :
> x := 7 :
> y := 8 :
> A1 := [a, 0];
```

$$A1 := [4,0] \quad \textbf{(3)}$$

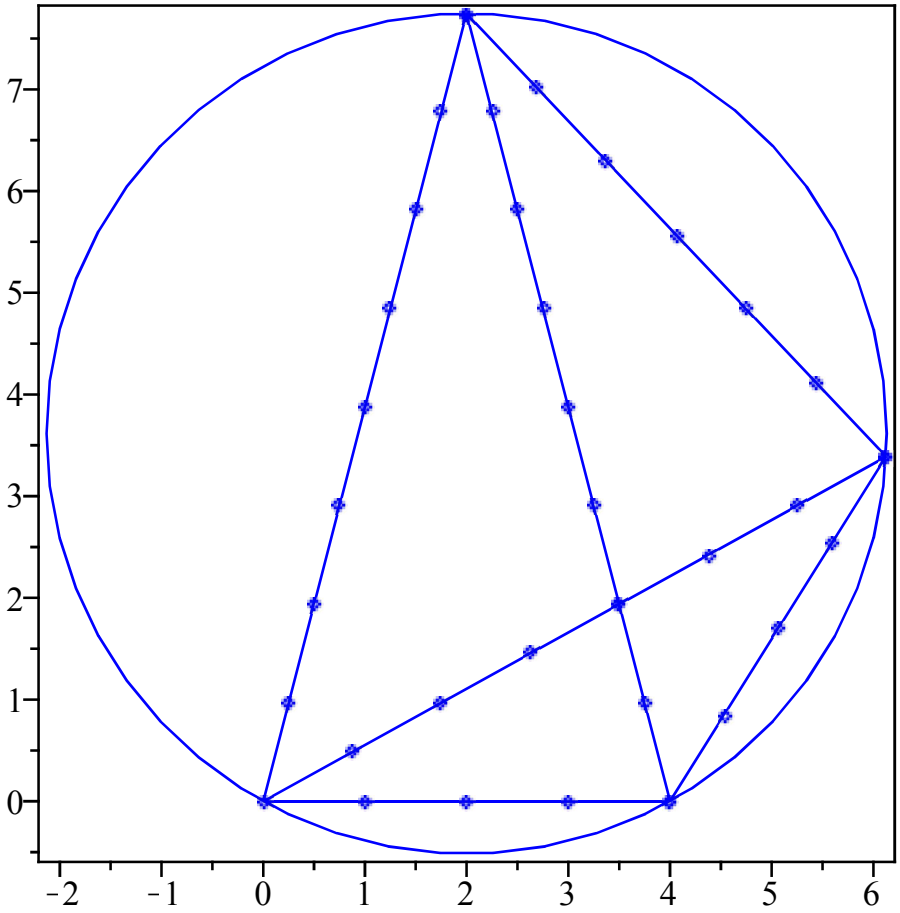
```
> ;
> Bcs := (a^2 + x^2 - b^2)/(2·a·x); Ccs := -(a^2 + y^2 - d^2)/(2·a·y);
```

$$Bcs := \frac{7}{8}$$
$$Ccs := -\frac{1}{4} \quad \textbf{(4)}$$

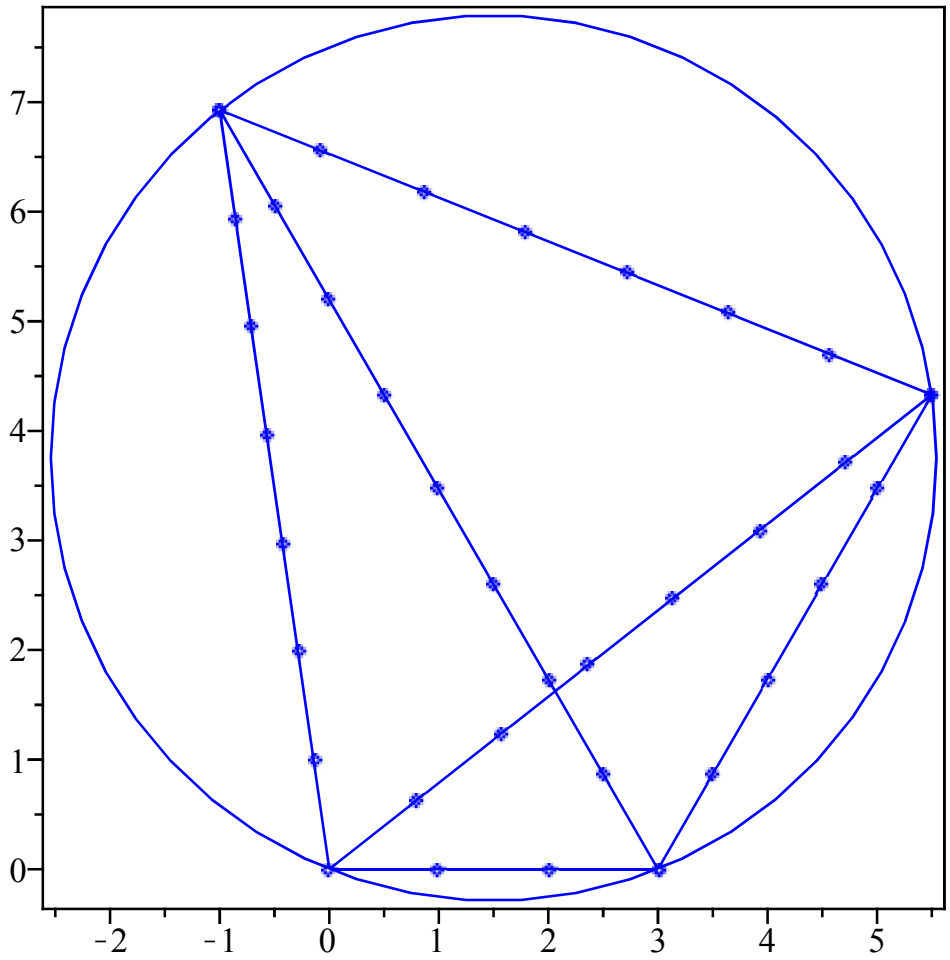
```
> Bsn := sqrt(1 - Bcs^2); Csn := sqrt(1 - Ccs^2); DI := b/Bsn;
```

$$Bsn := \frac{1}{8}\sqrt{15}$$
$$Csn := \frac{1}{4}\sqrt{15}$$
$$\textbf{(5)}$$

7-8-4-6-4-8
sikakukei by H.Ebisui

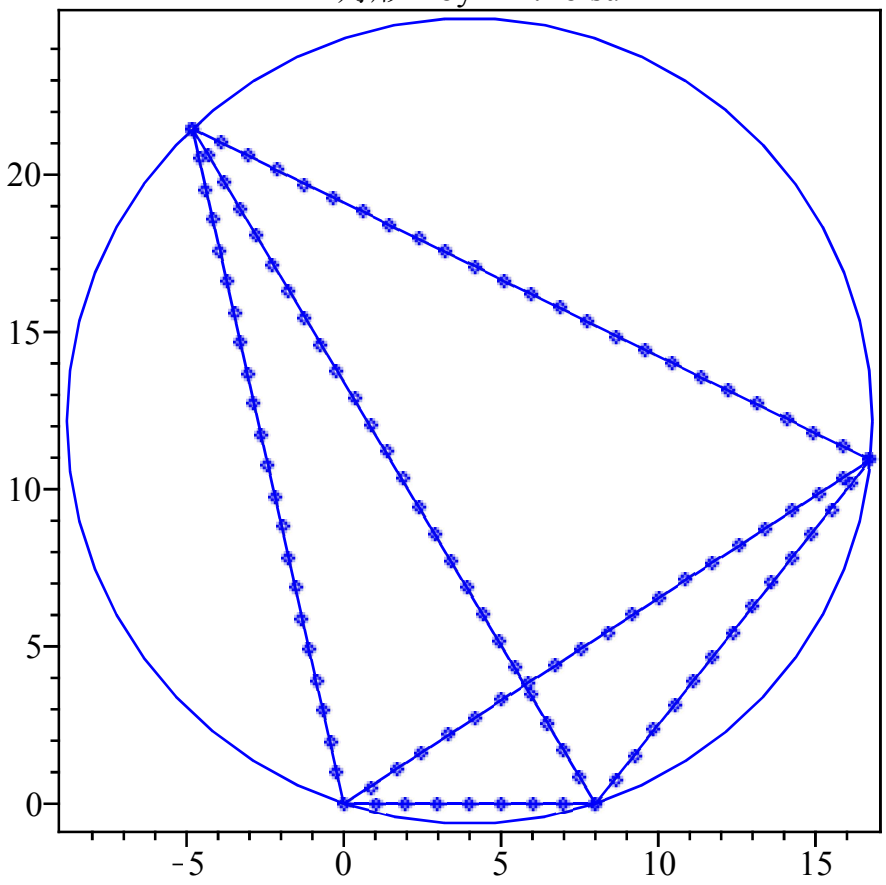


7-8-3-7-5-7 sikakukei by H.Ebisui



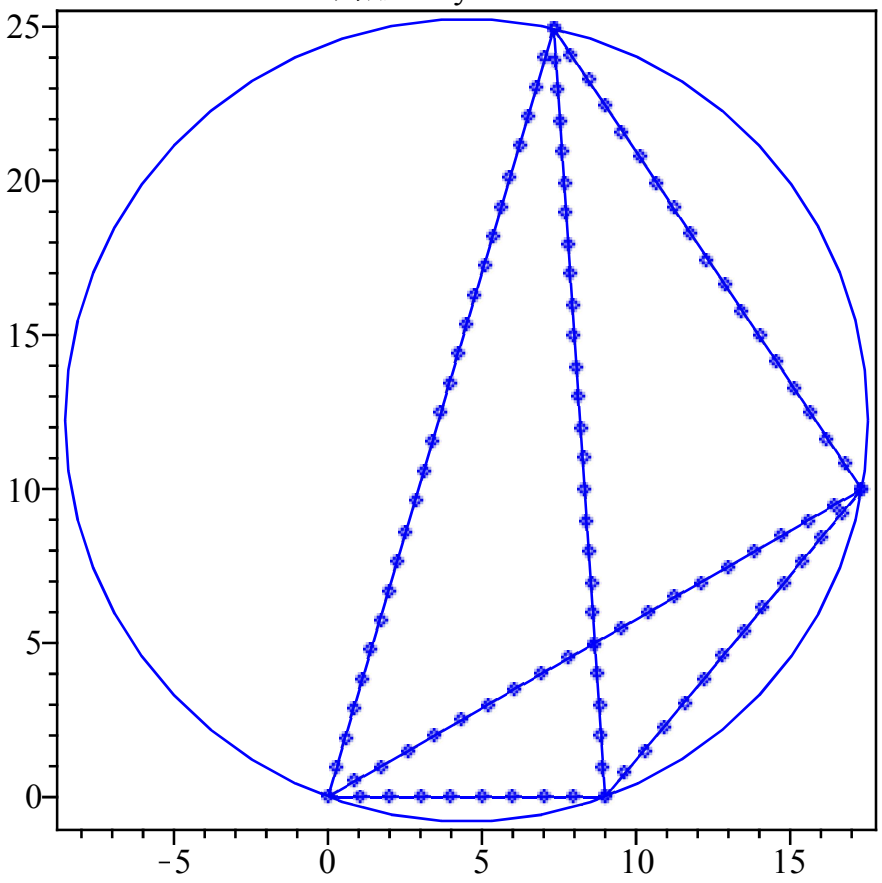
>

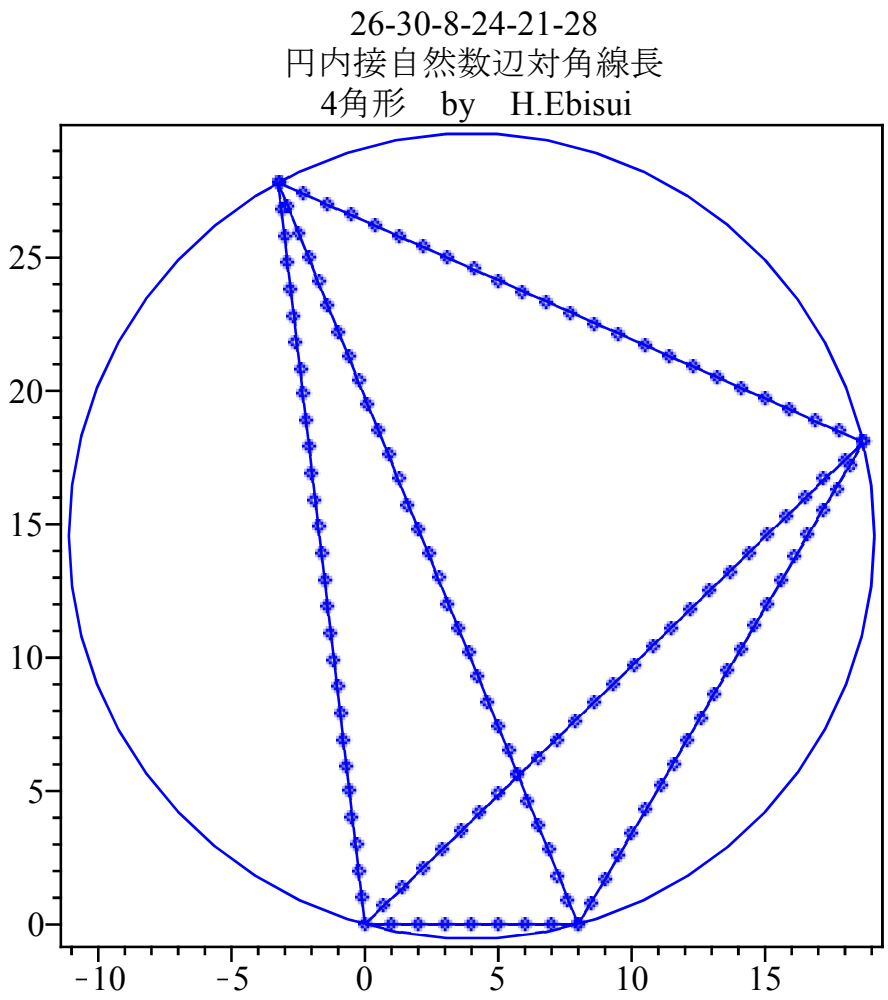
20-25-8-24-14-22
円内接自然数辺対角線長
4角形　by　H.Ebisui



>

20-25-9-18-13-26
円内接自然数辺対角線長
4角形　by　H.Ebisui




26-30-8-24-21-28
円内接自然数辺対角線長
4角形　by　H.Ebisui
25
20
15
10
5
0
-10
-5
0
5
10
15

リフレッシュコーナー
　　俳句と五行歌

春雨や　芽吹く街樹の　水滴

春雨も　今日は冷たさ　頬が濡れ

春雨を　思い出したる　水たまり

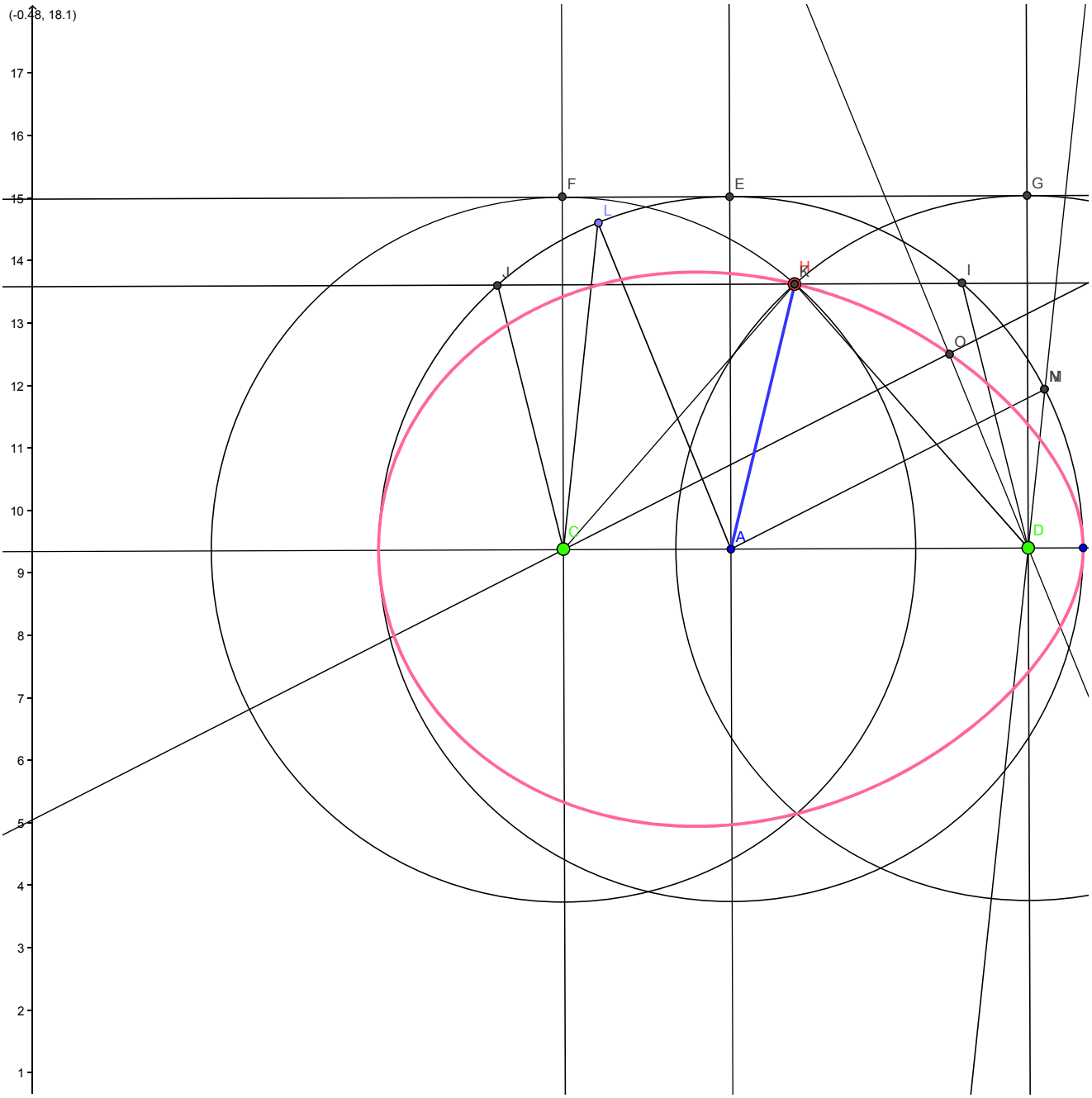
夕日記
意図記事に
一記事できる
ありがとう
PC

タマには
遊んでみたい
いや、もう何年も
遊んでいない
一人だから

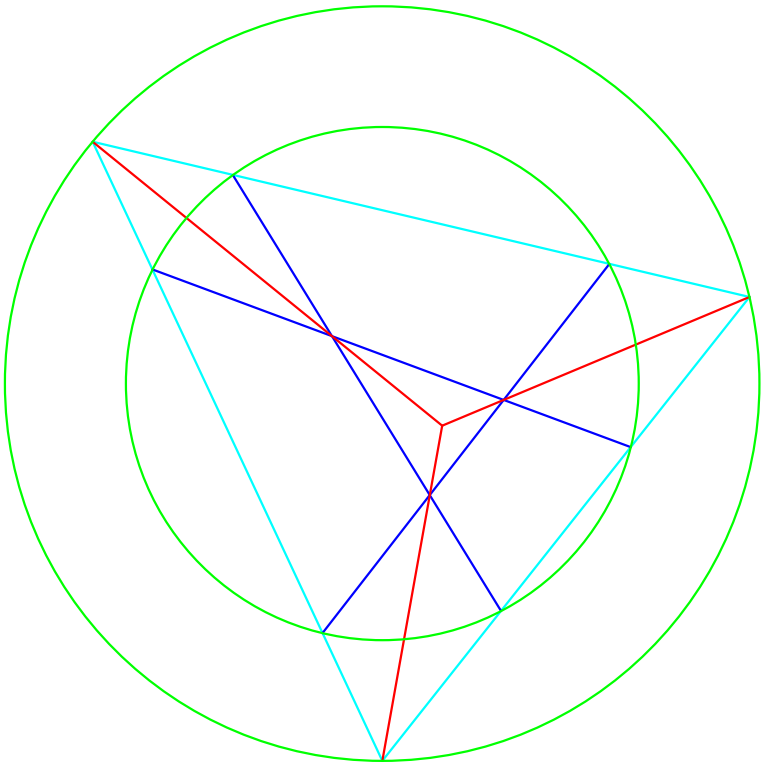
弧庵

Doval 短軸

H.Ebisui - 2012/03/14



ありがとう



(HEX 6 1)

数学日記

愛　と　理想

蛭子井博孝編著

第　８　日

数学という物事自身も,単純なものがいい。
単純で新しいもの
今日も見つかった。
たった７つの数の組
1000*(1000+1)/2 のなかに
それから、ニュートン線
いや、もう土筆が出ているかな
町のドーナッツ店にいては、自然はわからない。
でも、振り返った窓の外には明るい光。
並べたドーナッツの光っている。

*トピック
ニュートン線の定理の周辺
* 幾何と代数新作問題
点線円幾何学　HI-315
自然数数表 A^2+B^2 ＝ X^3　A<X<B
五行歌　俳句
題　土筆
*新作　式とグラフ（EQG）
空間　らせん
連載
Doval 幾何学入門
接線

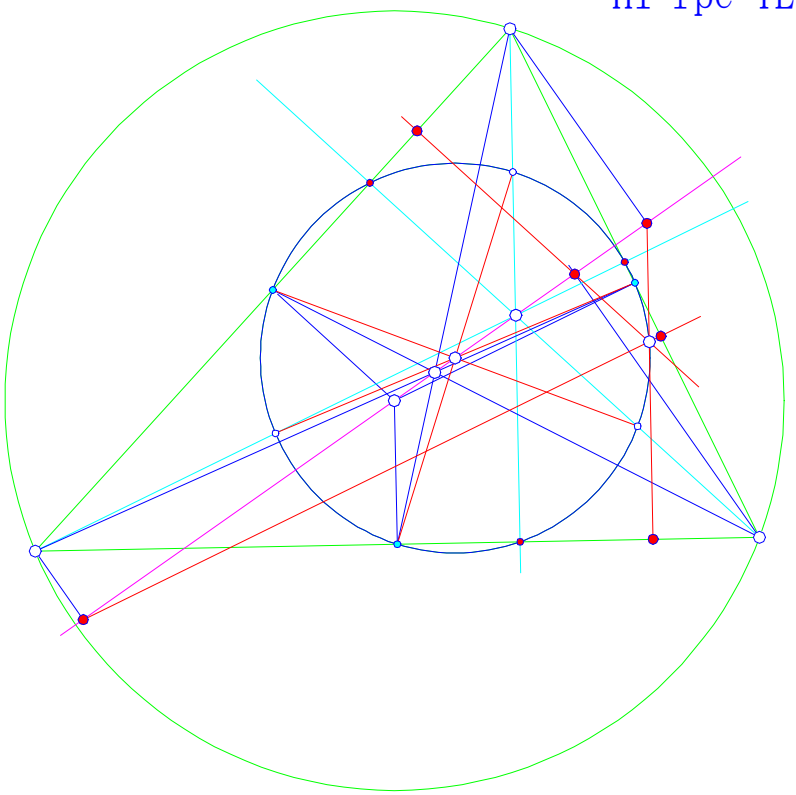
2012-3-15

今日のトピック

ニュートン線の周辺

ニュートン線に関する三角形の直極点は、九点円上にある。

HI-rpc TL0315-1



蛭子井博孝

```
> # Number Table Donut by H.E:
> c := 0 :for e from 2 to 2 do for h from e + 1 to 3 do sc := 0 :
    print("X is defined as Donut number", A^e + B^e = X^h, "A<X<B"); for a from 1
    to 1000 do for b from a to 1000 do y := a^e + b^e : x := floor(evalf(y^(1/h))) : if y = x^h
    and a < x and x < b then sc := sc + 1 : print(No = sc, A^e + B^e = X^h, [A, X, B, X^h], [a,
    x, b, y]) fi:od:od:od:od:
```

"X is defined as Donut number", $A^2 + B^2 = X^3$, "A<X<B"

$No = 1, A^2 + B^2 = X^3, [A, X, B, X^3], [2, 5, 11, 125]$

$No = 2, A^2 + B^2 = X^3, [A, X, B, X^3], [7, 65, 524, 274625]$

$No = 3, A^2 + B^2 = X^3, [A, X, B, X^3], [9, 13, 46, 2197]$

$No = 4, A^2 + B^2 = X^3, [A, X, B, X^3], [10, 34, 198, 39304]$

$No = 5, A^2 + B^2 = X^3, [A, X, B, X^3], [16, 20, 88, 8000]$

$No = 6, A^2 + B^2 = X^3, [A, X, B, X^3], [51, 85, 782, 614125]$

$No = 7, A^2 + B^2 = X^3, [A, X, B, X^3], [88, 89, 835, 704969]$ **(1)**

```
> with(plots);
```

[*animate, animate3d, animatecurve, arrow, changecoords, complexplot, complexplot3d, conformal, conformal3d, contourplot, contourplot3d, coordplot, coordplot3d, densityplot, display, dualaxisplot, fieldplot, fieldplot3d, gradplot, gradplot3d, implicitplot, implicitplot3d, inequal, interactive, interactiveparams, intersectplot, listcontplot, listcontplot3d, listdensityplot, listplot, listplot3d, loglogplot, logplot, matrixplot, multiple, odeplot, pareto, plotcompare, pointplot, pointplot3d, polarplot, polygonplot, polygonplot3d, polyhedra_supported, polyhedraplot, rootlocus, semilogplot, setcolors, setoptions, setoptions3d, spacecurve, sparsematrixplot, surfdata, textplot, textplot3d, tubeplot*] **(2)**

```
> x := sin(t)·t : y := diff(x, t) : z := x·y : tubeplot([x, y, z], t = 0..10·Pi, numpoints = 500,
    radius = 1.5, axes = box); print(EQ = [x, y, z], [t = 0..10·Pi]);
```

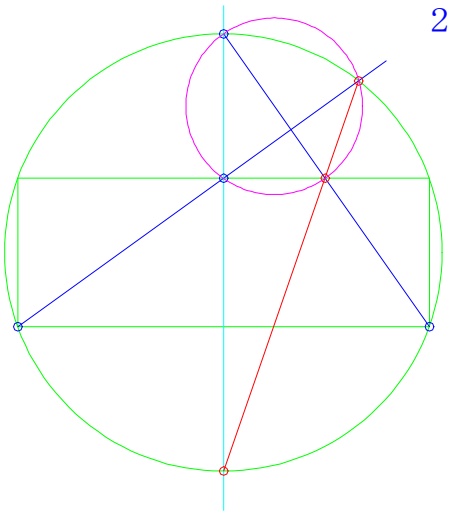
点線円幾何学

HI-315

HI-315

円中長方形の共線定理

2008-9-21



HI-rpc TL0315-2

蛭子井博孝

リフレッシュコーナー
　　俳句と五行歌

土筆ん坊　土から覗く　暖かさ

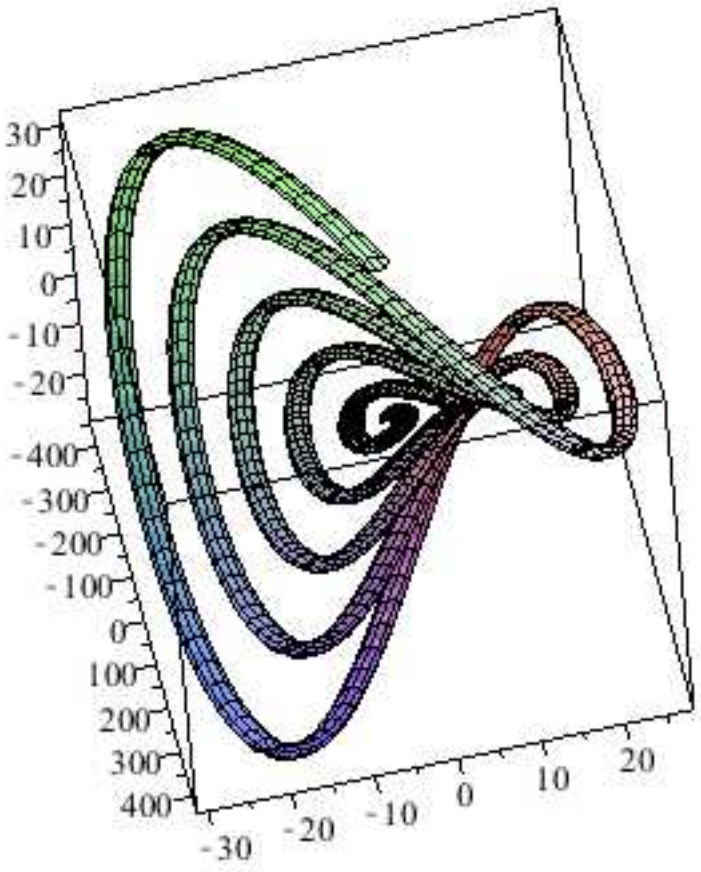
佃煮の　土筆なつかし　皿の上

春盛り　　土筆の胞子　飛び去った

つくしを
たくさんとった。
苦労して、袴を取り、
佃煮にしてくれた
母の味

土筆とスギナ
どうしてつながっているのだろう
今でも、既成概念の
不思議、
土手で味わう

弧庵

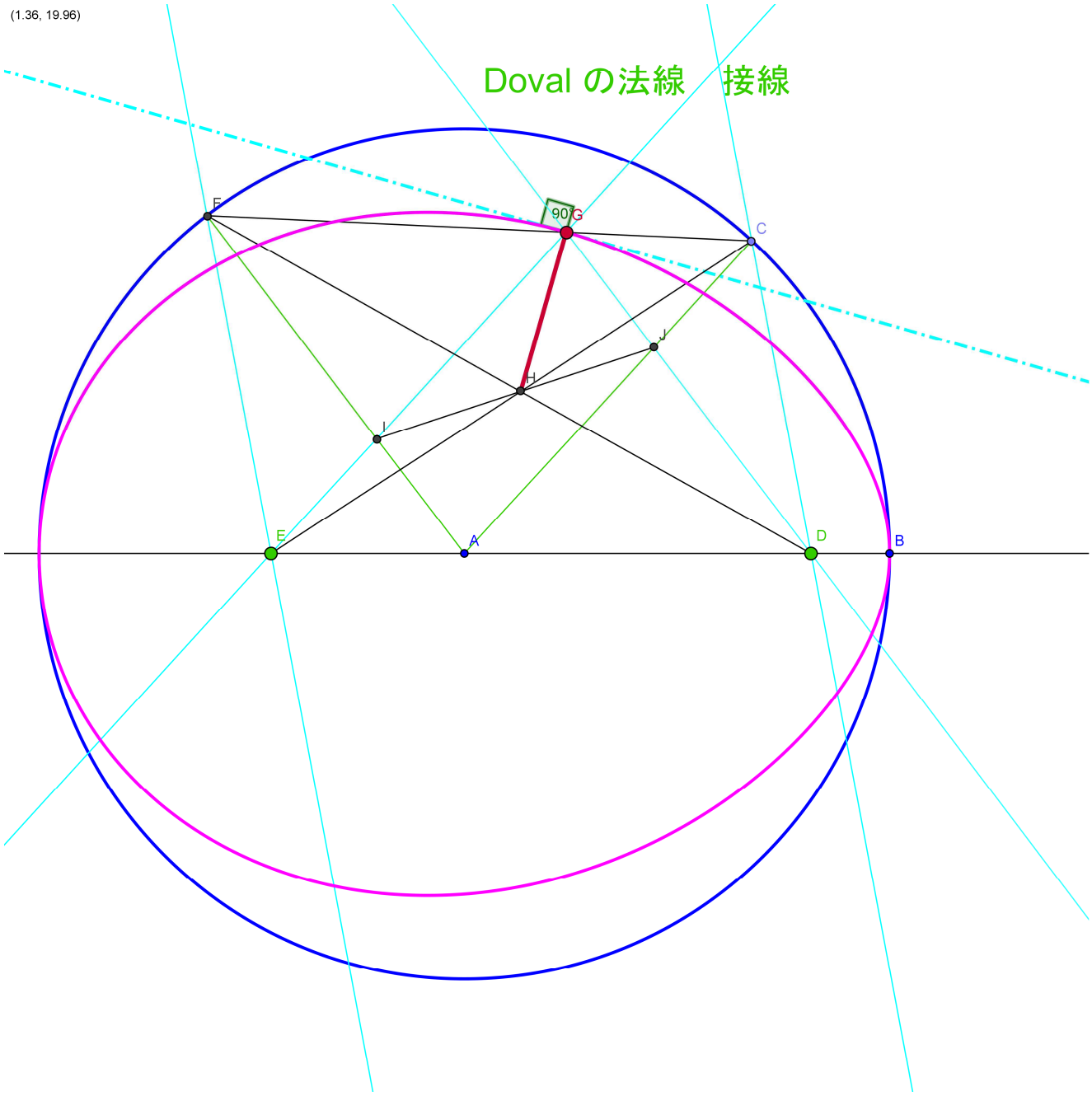


$$EQ = [\sin(t)\ t, \cos(t)\ t + \sin(t), \sin(t)\ t\ (\cos(t)\ t + \sin(t))\ ],\ [t = 0\ ..10\ \pi] \qquad \textbf{(3)}$$

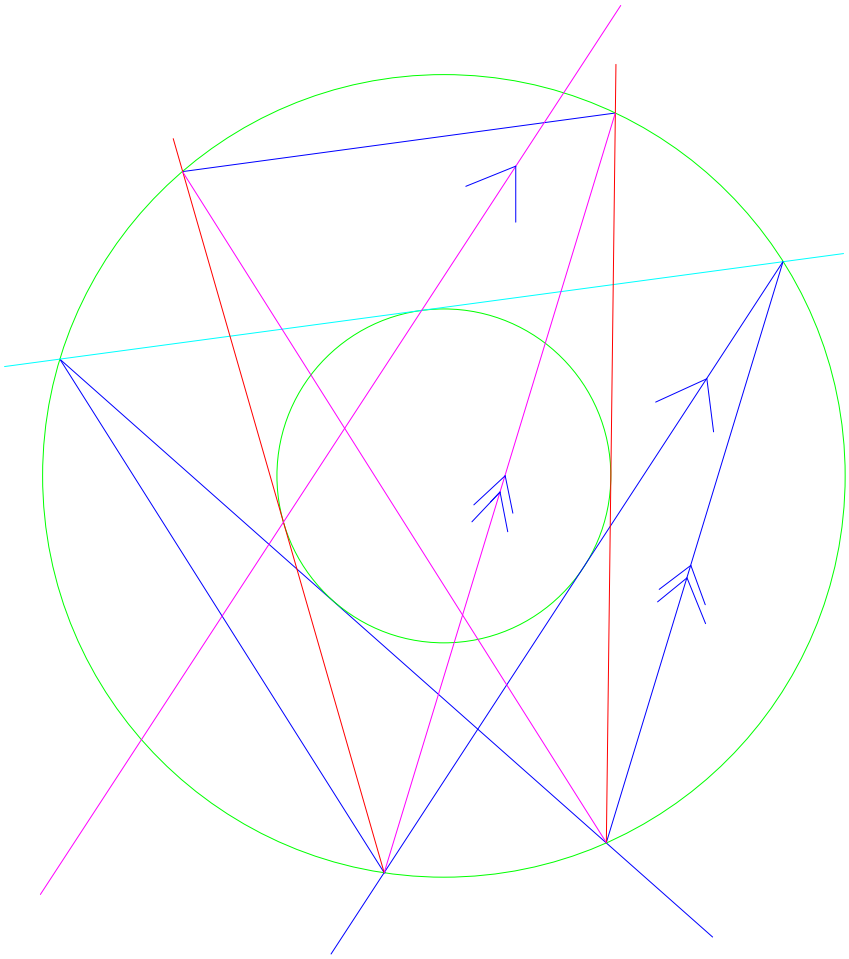
```
> ? tubeplot;
>
```

Dovalの法線接線

H.Ebisui - 2012/03/15



ありがとう



(HEX61)

数学日記

愛　と　理想

蛭子井博孝編著

第　９　日

今日　ICGG2012 に投稿したアブストラクトの受理の通知が来た。
広大に行く途中のＪＲの中で，確認した。
さて、今年の夏モントリオールにいけるか、生きたいが、交通費をどうするか
この日記中断していたが，ここ広大図書館談話室から、再開する。
数学とは何か、国際会議とは何か、いつも考えているが、この日記を続けることで、その解を見つけていきたい。
先日見つけていた，スタイナーの定理の周辺から、再開する

*トピック
シュタイナーの定理の周辺
* 幾何と代数新作問題
点線円幾何学　HI-321
1/a+1/b+1/c+1/d+1/e=1　となる,a,b,c,d,e 数表
五行歌　俳句
題　桜
*新作　式とグラフ（EQG）
春お粗末
連載
Doval 幾何学入門
等距離円

2012-3-21

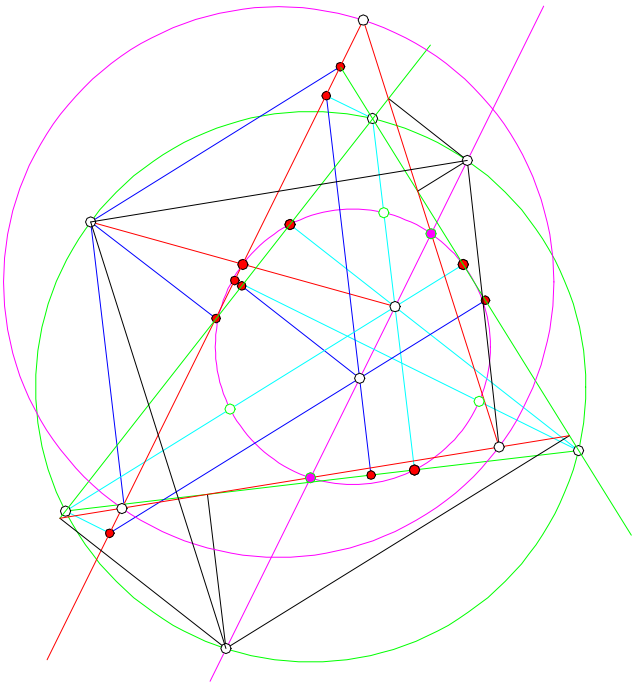
今日のトピック

シュタイナーの定理の周辺に遊び

蛭子井のシムソン線合同定理見つける幸せ　広大図書館にて

シュタイナーの定理の周辺に蛭子井のシムソン線合同定理あり

シムソン線直極点線合同定理



面積[mm2]　　9055.465

面積[mm2]　　9055.465

2012-3-21

蛭子井博孝

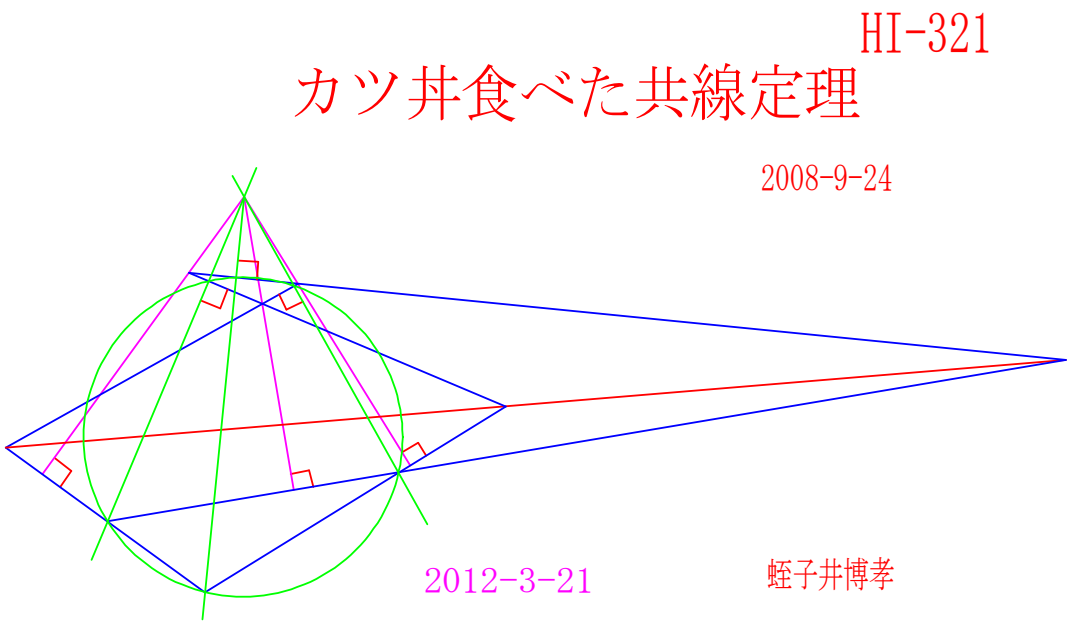
シムソン線蛭子井線合同定理

点線円幾何学

HI-321

直観で見つける共線、新たなマジェンダの 3 本の垂線を引いた。
それが、三角形の頂点を通過している.今日は、3 月 21 日

ありがとう、数学の女神さん



リフレッシュコーナー
俳句と五行歌

もうすぐ
桜が咲く
平和公園に
錦帯橋に
花が咲く

中１の生物の時間
白に紙に、はじめて、
桜を観察し,詳細に
描いた花びら

君と会い　花見弁当　陽も陽気

夢開く　入学電報　桜咲く

桜散る　花びらひらら　風に舞う

```
> # Bunsuu Shiki by H.E:
> restart :
> n := 0 : print("単位分数展開  by H.E") :for a from 1 to 5 do for b from a to 20 do for c
  from b to 30 do for d from c to 50 do for e from d to 360 do x := 1/a + 1/b + 1/c + 1/d
  + 1/e : if x = floor(evalf(x)) and x = 1 then n := n + 1 : print(H||n, 1/A + 1/B + 1/C
  + 1/D + 1/E = x, [1/A, 1/B, 1/C, 1/D, 1/E] = [1/a, 1/b, 1/c, 1/d, 1/e]) fi:od:od:od:od:od:
```

"単位分数展開 by H.E"

$$H1,\ \frac{1}{A}+\frac{1}{B}+\frac{1}{C}+\frac{1}{D}+\frac{1}{E}=1,\ \left[\frac{1}{A},\frac{1}{B},\frac{1}{C},\frac{1}{D},\frac{1}{E}\right]=\left[\frac{1}{2},\frac{1}{3},\frac{1}{7},\frac{1}{48},\frac{1}{336}\right]$$

$$H2,\ \frac{1}{A}+\frac{1}{B}+\frac{1}{C}+\frac{1}{D}+\frac{1}{E}=1,\ \left[\frac{1}{A},\frac{1}{B},\frac{1}{C},\frac{1}{D},\frac{1}{E}\right]=\left[\frac{1}{2},\frac{1}{3},\frac{1}{7},\frac{1}{49},\frac{1}{294}\right]$$

$$H3,\ \frac{1}{A}+\frac{1}{B}+\frac{1}{C}+\frac{1}{D}+\frac{1}{E}=1,\ \left[\frac{1}{A},\frac{1}{B},\frac{1}{C},\frac{1}{D},\frac{1}{E}\right]=\left[\frac{1}{2},\frac{1}{3},\frac{1}{8},\frac{1}{26},\frac{1}{312}\right]$$

$$H4,\ \frac{1}{A}+\frac{1}{B}+\frac{1}{C}+\frac{1}{D}+\frac{1}{E}=1,\ \left[\frac{1}{A},\frac{1}{B},\frac{1}{C},\frac{1}{D},\frac{1}{E}\right]=\left[\frac{1}{2},\frac{1}{3},\frac{1}{8},\frac{1}{27},\frac{1}{216}\right]$$

$$H5,\ \frac{1}{A}+\frac{1}{B}+\frac{1}{C}+\frac{1}{D}+\frac{1}{E}=1,\ \left[\frac{1}{A},\frac{1}{B},\frac{1}{C},\frac{1}{D},\frac{1}{E}\right]=\left[\frac{1}{2},\frac{1}{3},\frac{1}{8},\frac{1}{28},\frac{1}{168}\right]$$

$$H6,\ \frac{1}{A}+\frac{1}{B}+\frac{1}{C}+\frac{1}{D}+\frac{1}{E}=1,\ \left[\frac{1}{A},\frac{1}{B},\frac{1}{C},\frac{1}{D},\frac{1}{E}\right]=\left[\frac{1}{2},\frac{1}{3},\frac{1}{8},\frac{1}{30},\frac{1}{120}\right]$$

$$H7,\ \frac{1}{A}+\frac{1}{B}+\frac{1}{C}+\frac{1}{D}+\frac{1}{E}=1,\ \left[\frac{1}{A},\frac{1}{B},\frac{1}{C},\frac{1}{D},\frac{1}{E}\right]=\left[\frac{1}{2},\frac{1}{3},\frac{1}{8},\frac{1}{32},\frac{1}{96}\right]$$

$$H8,\ \frac{1}{A}+\frac{1}{B}+\frac{1}{C}+\frac{1}{D}+\frac{1}{E}=1,\ \left[\frac{1}{A},\frac{1}{B},\frac{1}{C},\frac{1}{D},\frac{1}{E}\right]=\left[\frac{1}{2},\frac{1}{3},\frac{1}{8},\frac{1}{33},\frac{1}{88}\right]$$

$$H9,\ \frac{1}{A}+\frac{1}{B}+\frac{1}{C}+\frac{1}{D}+\frac{1}{E}=1,\ \left[\frac{1}{A},\frac{1}{B},\frac{1}{C},\frac{1}{D},\frac{1}{E}\right]=\left[\frac{1}{2},\frac{1}{3},\frac{1}{8},\frac{1}{36},\frac{1}{72}\right]$$

$$H10,\ \frac{1}{A}+\frac{1}{B}+\frac{1}{C}+\frac{1}{D}+\frac{1}{E}=1,\ \left[\frac{1}{A},\frac{1}{B},\frac{1}{C},\frac{1}{D},\frac{1}{E}\right]=\left[\frac{1}{2},\frac{1}{3},\frac{1}{8},\frac{1}{40},\frac{1}{60}\right]$$

$$H11,\ \frac{1}{A}+\frac{1}{B}+\frac{1}{C}+\frac{1}{D}+\frac{1}{E}=1,\ \left[\frac{1}{A},\frac{1}{B},\frac{1}{C},\frac{1}{D},\frac{1}{E}\right]=\left[\frac{1}{2},\frac{1}{3},\frac{1}{8},\frac{1}{42},\frac{1}{56}\right]$$

$$H12,\ \frac{1}{A}+\frac{1}{B}+\frac{1}{C}+\frac{1}{D}+\frac{1}{E}=1,\ \left[\frac{1}{A},\frac{1}{B},\frac{1}{C},\frac{1}{D},\frac{1}{E}\right]=\left[\frac{1}{2},\frac{1}{3},\frac{1}{8},\frac{1}{48},\frac{1}{48}\right]$$

$$H13,\ \frac{1}{A}+\frac{1}{B}+\frac{1}{C}+\frac{1}{D}+\frac{1}{E}=1,\ \left[\frac{1}{A},\frac{1}{B},\frac{1}{C},\frac{1}{D},\frac{1}{E}\right]=\left[\frac{1}{2},\frac{1}{3},\frac{1}{9},\frac{1}{19},\frac{1}{342}\right]$$

$$H14,\ \frac{1}{A}+\frac{1}{B}+\frac{1}{C}+\frac{1}{D}+\frac{1}{E}=1,\ \left[\frac{1}{A},\frac{1}{B},\frac{1}{C},\frac{1}{D},\frac{1}{E}\right]=\left[\frac{1}{2},\frac{1}{3},\frac{1}{9},\frac{1}{20},\frac{1}{180}\right]$$

$$H15,\ \frac{1}{A}+\frac{1}{B}+\frac{1}{C}+\frac{1}{D}+\frac{1}{E}=1,\ \left[\frac{1}{A},\frac{1}{B},\frac{1}{C},\frac{1}{D},\frac{1}{E}\right]=\left[\frac{1}{2},\frac{1}{3},\frac{1}{9},\frac{1}{21},\frac{1}{126}\right]$$

$$H16,\ \frac{1}{A}+\frac{1}{B}+\frac{1}{C}+\frac{1}{D}+\frac{1}{E}=1,\ \left[\frac{1}{A},\frac{1}{B},\frac{1}{C},\frac{1}{D},\frac{1}{E}\right]=\left[\frac{1}{2},\frac{1}{3},\frac{1}{9},\frac{1}{22},\frac{1}{99}\right]$$

$$H17,\ \frac{1}{A}+\frac{1}{B}+\frac{1}{C}+\frac{1}{D}+\frac{1}{E}=1,\ \left[\frac{1}{A},\frac{1}{B},\frac{1}{C},\frac{1}{D},\frac{1}{E}\right]=\left[\frac{1}{2},\frac{1}{3},\frac{1}{9},\frac{1}{24},\frac{1}{72}\right]$$

$$H18,\ \frac{1}{A}+\frac{1}{B}+\frac{1}{C}+\frac{1}{D}+\frac{1}{E}=1,\ \left[\frac{1}{A},\frac{1}{B},\frac{1}{C},\frac{1}{D},\frac{1}{E}\right]=\left[\frac{1}{2},\frac{1}{3},\frac{1}{9},\frac{1}{27},\frac{1}{54}\right]$$

$$H19,\ \frac{1}{A}+\frac{1}{B}+\frac{1}{C}+\frac{1}{D}+\frac{1}{E}=1,\ \left[\frac{1}{A},\frac{1}{B},\frac{1}{C},\frac{1}{D},\frac{1}{E}\right]=\left[\frac{1}{2},\frac{1}{3},\frac{1}{9},\frac{1}{30},\frac{1}{45}\right]$$

$$H20,\ \frac{1}{A}+\frac{1}{B}+\frac{1}{C}+\frac{1}{\mathrm{D}}+\frac{1}{E}=1,\ \left[\frac{1}{A},\frac{1}{B},\frac{1}{C},\frac{1}{\mathrm{D}},\frac{1}{E}\right]=\left[\frac{1}{2},\frac{1}{3},\frac{1}{9},\frac{1}{36},\frac{1}{36}\right]$$

$$H21,\ \frac{1}{A}+\frac{1}{B}+\frac{1}{C}+\frac{1}{\mathrm{D}}+\frac{1}{E}=1,\ \left[\frac{1}{A},\frac{1}{B},\frac{1}{C},\frac{1}{\mathrm{D}},\frac{1}{E}\right]=\left[\frac{1}{2},\frac{1}{3},\frac{1}{10},\frac{1}{16},\frac{1}{240}\right]$$

$$H22,\ \frac{1}{A}+\frac{1}{B}+\frac{1}{C}+\frac{1}{\mathrm{D}}+\frac{1}{E}=1,\ \left[\frac{1}{A},\frac{1}{B},\frac{1}{C},\frac{1}{\mathrm{D}},\frac{1}{E}\right]=\left[\frac{1}{2},\frac{1}{3},\frac{1}{10},\frac{1}{18},\frac{1}{90}\right]$$

$$H23,\ \frac{1}{A}+\frac{1}{B}+\frac{1}{C}+\frac{1}{\mathrm{D}}+\frac{1}{E}=1,\ \left[\frac{1}{A},\frac{1}{B},\frac{1}{C},\frac{1}{\mathrm{D}},\frac{1}{E}\right]=\left[\frac{1}{2},\frac{1}{3},\frac{1}{10},\frac{1}{20},\frac{1}{60}\right]$$

$$H24,\ \frac{1}{A}+\frac{1}{B}+\frac{1}{C}+\frac{1}{\mathrm{D}}+\frac{1}{E}=1,\ \left[\frac{1}{A},\frac{1}{B},\frac{1}{C},\frac{1}{\mathrm{D}},\frac{1}{E}\right]=\left[\frac{1}{2},\frac{1}{3},\frac{1}{10},\frac{1}{24},\frac{1}{40}\right]$$

$$H25,\ \frac{1}{A}+\frac{1}{B}+\frac{1}{C}+\frac{1}{\mathrm{D}}+\frac{1}{E}=1,\ \left[\frac{1}{A},\frac{1}{B},\frac{1}{C},\frac{1}{\mathrm{D}},\frac{1}{E}\right]=\left[\frac{1}{2},\frac{1}{3},\frac{1}{10},\frac{1}{30},\frac{1}{30}\right]$$

$$H26,\ \frac{1}{A}+\frac{1}{B}+\frac{1}{C}+\frac{1}{\mathrm{D}}+\frac{1}{E}=1,\ \left[\frac{1}{A},\frac{1}{B},\frac{1}{C},\frac{1}{\mathrm{D}},\frac{1}{E}\right]=\left[\frac{1}{2},\frac{1}{3},\frac{1}{11},\frac{1}{14},\frac{1}{231}\right]$$

$$H27,\ \frac{1}{A}+\frac{1}{B}+\frac{1}{C}+\frac{1}{\mathrm{D}}+\frac{1}{E}=1,\ \left[\frac{1}{A},\frac{1}{B},\frac{1}{C},\frac{1}{\mathrm{D}},\frac{1}{E}\right]=\left[\frac{1}{2},\frac{1}{3},\frac{1}{11},\frac{1}{15},\frac{1}{110}\right]$$

$$H28,\ \frac{1}{A}+\frac{1}{B}+\frac{1}{C}+\frac{1}{\mathrm{D}}+\frac{1}{E}=1,\ \left[\frac{1}{A},\frac{1}{B},\frac{1}{C},\frac{1}{\mathrm{D}},\frac{1}{E}\right]=\left[\frac{1}{2},\frac{1}{3},\frac{1}{11},\frac{1}{22},\frac{1}{33}\right]$$

$$H29,\ \frac{1}{A}+\frac{1}{B}+\frac{1}{C}+\frac{1}{\mathrm{D}}+\frac{1}{E}=1,\ \left[\frac{1}{A},\frac{1}{B},\frac{1}{C},\frac{1}{\mathrm{D}},\frac{1}{E}\right]=\left[\frac{1}{2},\frac{1}{3},\frac{1}{12},\frac{1}{13},\frac{1}{156}\right]$$

$$H30,\ \frac{1}{A}+\frac{1}{B}+\frac{1}{C}+\frac{1}{\mathrm{D}}+\frac{1}{E}=1,\ \left[\frac{1}{A},\frac{1}{B},\frac{1}{C},\frac{1}{\mathrm{D}},\frac{1}{E}\right]=\left[\frac{1}{2},\frac{1}{3},\frac{1}{12},\frac{1}{14},\frac{1}{84}\right]$$

$$H31,\ \frac{1}{A}+\frac{1}{B}+\frac{1}{C}+\frac{1}{\mathrm{D}}+\frac{1}{E}=1,\ \left[\frac{1}{A},\frac{1}{B},\frac{1}{C},\frac{1}{\mathrm{D}},\frac{1}{E}\right]=\left[\frac{1}{2},\frac{1}{3},\frac{1}{12},\frac{1}{15},\frac{1}{60}\right]$$

$$H32,\ \frac{1}{A}+\frac{1}{B}+\frac{1}{C}+\frac{1}{\mathrm{D}}+\frac{1}{E}=1,\ \left[\frac{1}{A},\frac{1}{B},\frac{1}{C},\frac{1}{\mathrm{D}},\frac{1}{E}\right]=\left[\frac{1}{2},\frac{1}{3},\frac{1}{12},\frac{1}{16},\frac{1}{48}\right]$$

$$H33,\ \frac{1}{A}+\frac{1}{B}+\frac{1}{C}+\frac{1}{\mathrm{D}}+\frac{1}{E}=1,\ \left[\frac{1}{A},\frac{1}{B},\frac{1}{C},\frac{1}{\mathrm{D}},\frac{1}{E}\right]=\left[\frac{1}{2},\frac{1}{3},\frac{1}{12},\frac{1}{18},\frac{1}{36}\right]$$

$$H34,\ \frac{1}{A}+\frac{1}{B}+\frac{1}{C}+\frac{1}{\mathrm{D}}+\frac{1}{E}=1,\ \left[\frac{1}{A},\frac{1}{B},\frac{1}{C},\frac{1}{\mathrm{D}},\frac{1}{E}\right]=\left[\frac{1}{2},\frac{1}{3},\frac{1}{12},\frac{1}{20},\frac{1}{30}\right]$$

$$H35,\ \frac{1}{A}+\frac{1}{B}+\frac{1}{C}+\frac{1}{\mathrm{D}}+\frac{1}{E}=1,\ \left[\frac{1}{A},\frac{1}{B},\frac{1}{C},\frac{1}{\mathrm{D}},\frac{1}{E}\right]=\left[\frac{1}{2},\frac{1}{3},\frac{1}{12},\frac{1}{21},\frac{1}{28}\right]$$

$$H36,\ \frac{1}{A}+\frac{1}{B}+\frac{1}{C}+\frac{1}{\mathrm{D}}+\frac{1}{E}=1,\ \left[\frac{1}{A},\frac{1}{B},\frac{1}{C},\frac{1}{\mathrm{D}},\frac{1}{E}\right]=\left[\frac{1}{2},\frac{1}{3},\frac{1}{12},\frac{1}{24},\frac{1}{24}\right]$$

$$H37,\ \frac{1}{A}+\frac{1}{B}+\frac{1}{C}+\frac{1}{\mathrm{D}}+\frac{1}{E}=1,\ \left[\frac{1}{A},\frac{1}{B},\frac{1}{C},\frac{1}{\mathrm{D}},\frac{1}{E}\right]=\left[\frac{1}{2},\frac{1}{3},\frac{1}{13},\frac{1}{13},\frac{1}{78}\right]$$

$$H38,\ \frac{1}{A}+\frac{1}{B}+\frac{1}{C}+\frac{1}{\mathrm{D}}+\frac{1}{E}=1,\ \left[\frac{1}{A},\frac{1}{B},\frac{1}{C},\frac{1}{\mathrm{D}},\frac{1}{E}\right]=\left[\frac{1}{2},\frac{1}{3},\frac{1}{14},\frac{1}{14},\frac{1}{42}\right]$$

$$H39,\ \frac{1}{A}+\frac{1}{B}+\frac{1}{C}+\frac{1}{\mathrm{D}}+\frac{1}{E}=1,\ \left[\frac{1}{A},\frac{1}{B},\frac{1}{C},\frac{1}{\mathrm{D}},\frac{1}{E}\right]=\left[\frac{1}{2},\frac{1}{3},\frac{1}{14},\frac{1}{15},\frac{1}{35}\right]$$

$$H40,\ \frac{1}{A}+\frac{1}{B}+\frac{1}{C}+\frac{1}{\mathrm{D}}+\frac{1}{E}=1,\ \left[\frac{1}{A},\frac{1}{B},\frac{1}{C},\frac{1}{\mathrm{D}},\frac{1}{E}\right]=\left[\frac{1}{2},\frac{1}{3},\frac{1}{14},\frac{1}{21},\frac{1}{21}\right]$$

$$H41,\ \frac{1}{A}+\frac{1}{B}+\frac{1}{C}+\frac{1}{\mathrm{D}}+\frac{1}{E}=1,\ \left[\frac{1}{A},\frac{1}{B},\frac{1}{C},\frac{1}{\mathrm{D}},\frac{1}{E}\right]=\left[\frac{1}{2},\frac{1}{3},\frac{1}{15},\frac{1}{15},\frac{1}{30}\right]$$

$$H42,\ \frac{1}{A}+\frac{1}{B}+\frac{1}{C}+\frac{1}{\mathrm{D}}+\frac{1}{E}=1,\ \left[\frac{1}{A},\frac{1}{B},\frac{1}{C},\frac{1}{\mathrm{D}},\frac{1}{E}\right]=\left[\frac{1}{2},\frac{1}{3},\frac{1}{15},\frac{1}{20},\frac{1}{20}\right]$$

$$H43,\ \frac{1}{A}+\frac{1}{B}+\frac{1}{C}+\frac{1}{D}+\frac{1}{E}=1,\ \left[\frac{1}{A},\frac{1}{B},\frac{1}{C},\frac{1}{D},\frac{1}{E}\right]=\left[\frac{1}{2},\frac{1}{3},\frac{1}{16},\frac{1}{16},\frac{1}{24}\right]$$

$$H44,\ \frac{1}{A}+\frac{1}{B}+\frac{1}{C}+\frac{1}{D}+\frac{1}{E}=1,\ \left[\frac{1}{A},\frac{1}{B},\frac{1}{C},\frac{1}{D},\frac{1}{E}\right]=\left[\frac{1}{2},\frac{1}{3},\frac{1}{18},\frac{1}{18},\frac{1}{18}\right]$$

$$H45,\ \frac{1}{A}+\frac{1}{B}+\frac{1}{C}+\frac{1}{D}+\frac{1}{E}=1,\ \left[\frac{1}{A},\frac{1}{B},\frac{1}{C},\frac{1}{D},\frac{1}{E}\right]=\left[\frac{1}{2},\frac{1}{4},\frac{1}{5},\frac{1}{22},\frac{1}{220}\right]$$

$$H46,\ \frac{1}{A}+\frac{1}{B}+\frac{1}{C}+\frac{1}{D}+\frac{1}{E}=1,\ \left[\frac{1}{A},\frac{1}{B},\frac{1}{C},\frac{1}{D},\frac{1}{E}\right]=\left[\frac{1}{2},\frac{1}{4},\frac{1}{5},\frac{1}{24},\frac{1}{120}\right]$$

$$H47,\ \frac{1}{A}+\frac{1}{B}+\frac{1}{C}+\frac{1}{D}+\frac{1}{E}=1,\ \left[\frac{1}{A},\frac{1}{B},\frac{1}{C},\frac{1}{D},\frac{1}{E}\right]=\left[\frac{1}{2},\frac{1}{4},\frac{1}{5},\frac{1}{25},\frac{1}{100}\right]$$

$$H48,\ \frac{1}{A}+\frac{1}{B}+\frac{1}{C}+\frac{1}{D}+\frac{1}{E}=1,\ \left[\frac{1}{A},\frac{1}{B},\frac{1}{C},\frac{1}{D},\frac{1}{E}\right]=\left[\frac{1}{2},\frac{1}{4},\frac{1}{5},\frac{1}{28},\frac{1}{70}\right]$$

$$H49,\ \frac{1}{A}+\frac{1}{B}+\frac{1}{C}+\frac{1}{D}+\frac{1}{E}=1,\ \left[\frac{1}{A},\frac{1}{B},\frac{1}{C},\frac{1}{D},\frac{1}{E}\right]=\left[\frac{1}{2},\frac{1}{4},\frac{1}{5},\frac{1}{30},\frac{1}{60}\right]$$

$$H50,\ \frac{1}{A}+\frac{1}{B}+\frac{1}{C}+\frac{1}{D}+\frac{1}{E}=1,\ \left[\frac{1}{A},\frac{1}{B},\frac{1}{C},\frac{1}{D},\frac{1}{E}\right]=\left[\frac{1}{2},\frac{1}{4},\frac{1}{5},\frac{1}{36},\frac{1}{45}\right]$$

$$H51,\ \frac{1}{A}+\frac{1}{B}+\frac{1}{C}+\frac{1}{D}+\frac{1}{E}=1,\ \left[\frac{1}{A},\frac{1}{B},\frac{1}{C},\frac{1}{D},\frac{1}{E}\right]=\left[\frac{1}{2},\frac{1}{4},\frac{1}{5},\frac{1}{40},\frac{1}{40}\right]$$

$$H52,\ \frac{1}{A}+\frac{1}{B}+\frac{1}{C}+\frac{1}{D}+\frac{1}{E}=1,\ \left[\frac{1}{A},\frac{1}{B},\frac{1}{C},\frac{1}{D},\frac{1}{E}\right]=\left[\frac{1}{2},\frac{1}{4},\frac{1}{6},\frac{1}{13},\frac{1}{156}\right]$$

$$H53,\ \frac{1}{A}+\frac{1}{B}+\frac{1}{C}+\frac{1}{D}+\frac{1}{E}=1,\ \left[\frac{1}{A},\frac{1}{B},\frac{1}{C},\frac{1}{D},\frac{1}{E}\right]=\left[\frac{1}{2},\frac{1}{4},\frac{1}{6},\frac{1}{14},\frac{1}{84}\right]$$

$$H54,\ \frac{1}{A}+\frac{1}{B}+\frac{1}{C}+\frac{1}{D}+\frac{1}{E}=1,\ \left[\frac{1}{A},\frac{1}{B},\frac{1}{C},\frac{1}{D},\frac{1}{E}\right]=\left[\frac{1}{2},\frac{1}{4},\frac{1}{6},\frac{1}{15},\frac{1}{60}\right]$$

$$H55,\ \frac{1}{A}+\frac{1}{B}+\frac{1}{C}+\frac{1}{D}+\frac{1}{E}=1,\ \left[\frac{1}{A},\frac{1}{B},\frac{1}{C},\frac{1}{D},\frac{1}{E}\right]=\left[\frac{1}{2},\frac{1}{4},\frac{1}{6},\frac{1}{16},\frac{1}{48}\right]$$

$$H56,\ \frac{1}{A}+\frac{1}{B}+\frac{1}{C}+\frac{1}{D}+\frac{1}{E}=1,\ \left[\frac{1}{A},\frac{1}{B},\frac{1}{C},\frac{1}{D},\frac{1}{E}\right]=\left[\frac{1}{2},\frac{1}{4},\frac{1}{6},\frac{1}{18},\frac{1}{36}\right]$$

$$H57,\ \frac{1}{A}+\frac{1}{B}+\frac{1}{C}+\frac{1}{D}+\frac{1}{E}=1,\ \left[\frac{1}{A},\frac{1}{B},\frac{1}{C},\frac{1}{D},\frac{1}{E}\right]=\left[\frac{1}{2},\frac{1}{4},\frac{1}{6},\frac{1}{20},\frac{1}{30}\right]$$

$$H58,\ \frac{1}{A}+\frac{1}{B}+\frac{1}{C}+\frac{1}{D}+\frac{1}{E}=1,\ \left[\frac{1}{A},\frac{1}{B},\frac{1}{C},\frac{1}{D},\frac{1}{E}\right]=\left[\frac{1}{2},\frac{1}{4},\frac{1}{6},\frac{1}{21},\frac{1}{28}\right]$$

$$H59,\ \frac{1}{A}+\frac{1}{B}+\frac{1}{C}+\frac{1}{D}+\frac{1}{E}=1,\ \left[\frac{1}{A},\frac{1}{B},\frac{1}{C},\frac{1}{D},\frac{1}{E}\right]=\left[\frac{1}{2},\frac{1}{4},\frac{1}{6},\frac{1}{24},\frac{1}{24}\right]$$

$$H60,\ \frac{1}{A}+\frac{1}{B}+\frac{1}{C}+\frac{1}{D}+\frac{1}{E}=1,\ \left[\frac{1}{A},\frac{1}{B},\frac{1}{C},\frac{1}{D},\frac{1}{E}\right]=\left[\frac{1}{2},\frac{1}{4},\frac{1}{7},\frac{1}{10},\frac{1}{140}\right]$$

$$H61,\ \frac{1}{A}+\frac{1}{B}+\frac{1}{C}+\frac{1}{D}+\frac{1}{E}=1,\ \left[\frac{1}{A},\frac{1}{B},\frac{1}{C},\frac{1}{D},\frac{1}{E}\right]=\left[\frac{1}{2},\frac{1}{4},\frac{1}{7},\frac{1}{12},\frac{1}{42}\right]$$

$$H62,\ \frac{1}{A}+\frac{1}{B}+\frac{1}{C}+\frac{1}{D}+\frac{1}{E}=1,\ \left[\frac{1}{A},\frac{1}{B},\frac{1}{C},\frac{1}{D},\frac{1}{E}\right]=\left[\frac{1}{2},\frac{1}{4},\frac{1}{7},\frac{1}{14},\frac{1}{28}\right]$$

$$H63,\ \frac{1}{A}+\frac{1}{B}+\frac{1}{C}+\frac{1}{D}+\frac{1}{E}=1,\ \left[\frac{1}{A},\frac{1}{B},\frac{1}{C},\frac{1}{D},\frac{1}{E}\right]=\left[\frac{1}{2},\frac{1}{4},\frac{1}{8},\frac{1}{9},\frac{1}{72}\right]$$

$$H64,\ \frac{1}{A}+\frac{1}{B}+\frac{1}{C}+\frac{1}{D}+\frac{1}{E}=1,\ \left[\frac{1}{A},\frac{1}{B},\frac{1}{C},\frac{1}{D},\frac{1}{E}\right]=\left[\frac{1}{2},\frac{1}{4},\frac{1}{8},\frac{1}{10},\frac{1}{40}\right]$$

$$H65,\ \frac{1}{A}+\frac{1}{B}+\frac{1}{C}+\frac{1}{D}+\frac{1}{E}=1,\ \left[\frac{1}{A},\frac{1}{B},\frac{1}{C},\frac{1}{D},\frac{1}{E}\right]=\left[\frac{1}{2},\frac{1}{4},\frac{1}{8},\frac{1}{12},\frac{1}{24}\right]$$

$$H66,\ \frac{1}{A}+\frac{1}{B}+\frac{1}{C}+\frac{1}{D}+\frac{1}{E}=1,\ \left[\frac{1}{A},\frac{1}{B},\frac{1}{C},\frac{1}{D},\frac{1}{E}\right]=\left[\frac{1}{2},\frac{1}{4},\frac{1}{8},\frac{1}{16},\frac{1}{16}\right]$$

$$H67,\ \frac{1}{A}+\frac{1}{B}+\frac{1}{C}+\frac{1}{D}+\frac{1}{E}=1,\ \left[\frac{1}{A},\frac{1}{B},\frac{1}{C},\frac{1}{D},\frac{1}{E}\right]=\left[\frac{1}{2},\frac{1}{4},\frac{1}{9},\frac{1}{9},\frac{1}{36}\right]$$

$$H68,\ \frac{1}{A}+\frac{1}{B}+\frac{1}{C}+\frac{1}{D}+\frac{1}{E}=1,\ \left[\frac{1}{A},\frac{1}{B},\frac{1}{C},\frac{1}{D},\frac{1}{E}\right]=\left[\frac{1}{2},\frac{1}{4},\frac{1}{9},\frac{1}{12},\frac{1}{18}\right]$$

$$H69,\ \frac{1}{A}+\frac{1}{B}+\frac{1}{C}+\frac{1}{D}+\frac{1}{E}=1,\ \left[\frac{1}{A},\frac{1}{B},\frac{1}{C},\frac{1}{D},\frac{1}{E}\right]=\left[\frac{1}{2},\frac{1}{4},\frac{1}{10},\frac{1}{10},\frac{1}{20}\right]$$

$$H70,\ \frac{1}{A}+\frac{1}{B}+\frac{1}{C}+\frac{1}{D}+\frac{1}{E}=1,\ \left[\frac{1}{A},\frac{1}{B},\frac{1}{C},\frac{1}{D},\frac{1}{E}\right]=\left[\frac{1}{2},\frac{1}{4},\frac{1}{10},\frac{1}{12},\frac{1}{15}\right]$$

$$H71,\ \frac{1}{A}+\frac{1}{B}+\frac{1}{C}+\frac{1}{D}+\frac{1}{E}=1,\ \left[\frac{1}{A},\frac{1}{B},\frac{1}{C},\frac{1}{D},\frac{1}{E}\right]=\left[\frac{1}{2},\frac{1}{4},\frac{1}{12},\frac{1}{12},\frac{1}{12}\right]$$

$$H72,\ \frac{1}{A}+\frac{1}{B}+\frac{1}{C}+\frac{1}{D}+\frac{1}{E}=1,\ \left[\frac{1}{A},\frac{1}{B},\frac{1}{C},\frac{1}{D},\frac{1}{E}\right]=\left[\frac{1}{2},\frac{1}{5},\frac{1}{5},\frac{1}{11},\frac{1}{110}\right]$$

$$H73,\ \frac{1}{A}+\frac{1}{B}+\frac{1}{C}+\frac{1}{D}+\frac{1}{E}=1,\ \left[\frac{1}{A},\frac{1}{B},\frac{1}{C},\frac{1}{D},\frac{1}{E}\right]=\left[\frac{1}{2},\frac{1}{5},\frac{1}{5},\frac{1}{12},\frac{1}{60}\right]$$

$$H74,\ \frac{1}{A}+\frac{1}{B}+\frac{1}{C}+\frac{1}{D}+\frac{1}{E}=1,\ \left[\frac{1}{A},\frac{1}{B},\frac{1}{C},\frac{1}{D},\frac{1}{E}\right]=\left[\frac{1}{2},\frac{1}{5},\frac{1}{5},\frac{1}{14},\frac{1}{35}\right]$$

$$H75,\ \frac{1}{A}+\frac{1}{B}+\frac{1}{C}+\frac{1}{D}+\frac{1}{E}=1,\ \left[\frac{1}{A},\frac{1}{B},\frac{1}{C},\frac{1}{D},\frac{1}{E}\right]=\left[\frac{1}{2},\frac{1}{5},\frac{1}{5},\frac{1}{15},\frac{1}{30}\right]$$

$$H76,\ \frac{1}{A}+\frac{1}{B}+\frac{1}{C}+\frac{1}{D}+\frac{1}{E}=1,\ \left[\frac{1}{A},\frac{1}{B},\frac{1}{C},\frac{1}{D},\frac{1}{E}\right]=\left[\frac{1}{2},\frac{1}{5},\frac{1}{5},\frac{1}{20},\frac{1}{20}\right]$$

$$H77,\ \frac{1}{A}+\frac{1}{B}+\frac{1}{C}+\frac{1}{D}+\frac{1}{E}=1,\ \left[\frac{1}{A},\frac{1}{B},\frac{1}{C},\frac{1}{D},\frac{1}{E}\right]=\left[\frac{1}{2},\frac{1}{5},\frac{1}{6},\frac{1}{8},\frac{1}{120}\right]$$

$$H78,\ \frac{1}{A}+\frac{1}{B}+\frac{1}{C}+\frac{1}{D}+\frac{1}{E}=1,\ \left[\frac{1}{A},\frac{1}{B},\frac{1}{C},\frac{1}{D},\frac{1}{E}\right]=\left[\frac{1}{2},\frac{1}{5},\frac{1}{6},\frac{1}{9},\frac{1}{45}\right]$$

$$H79,\ \frac{1}{A}+\frac{1}{B}+\frac{1}{C}+\frac{1}{D}+\frac{1}{E}=1,\ \left[\frac{1}{A},\frac{1}{B},\frac{1}{C},\frac{1}{D},\frac{1}{E}\right]=\left[\frac{1}{2},\frac{1}{5},\frac{1}{6},\frac{1}{10},\frac{1}{30}\right]$$

$$H80,\ \frac{1}{A}+\frac{1}{B}+\frac{1}{C}+\frac{1}{D}+\frac{1}{E}=1,\ \left[\frac{1}{A},\frac{1}{B},\frac{1}{C},\frac{1}{D},\frac{1}{E}\right]=\left[\frac{1}{2},\frac{1}{5},\frac{1}{6},\frac{1}{12},\frac{1}{20}\right]$$

$$H81,\ \frac{1}{A}+\frac{1}{B}+\frac{1}{C}+\frac{1}{D}+\frac{1}{E}=1,\ \left[\frac{1}{A},\frac{1}{B},\frac{1}{C},\frac{1}{D},\frac{1}{E}\right]=\left[\frac{1}{2},\frac{1}{5},\frac{1}{6},\frac{1}{15},\frac{1}{15}\right]$$

$$H82,\ \frac{1}{A}+\frac{1}{B}+\frac{1}{C}+\frac{1}{D}+\frac{1}{E}=1,\ \left[\frac{1}{A},\frac{1}{B},\frac{1}{C},\frac{1}{D},\frac{1}{E}\right]=\left[\frac{1}{2},\frac{1}{5},\frac{1}{7},\frac{1}{7},\frac{1}{70}\right]$$

$$H83,\ \frac{1}{A}+\frac{1}{B}+\frac{1}{C}+\frac{1}{D}+\frac{1}{E}=1,\ \left[\frac{1}{A},\frac{1}{B},\frac{1}{C},\frac{1}{D},\frac{1}{E}\right]=\left[\frac{1}{2},\frac{1}{5},\frac{1}{8},\frac{1}{8},\frac{1}{20}\right]$$

$$H84,\ \frac{1}{A}+\frac{1}{B}+\frac{1}{C}+\frac{1}{D}+\frac{1}{E}=1,\ \left[\frac{1}{A},\frac{1}{B},\frac{1}{C},\frac{1}{D},\frac{1}{E}\right]=\left[\frac{1}{2},\frac{1}{5},\frac{1}{10},\frac{1}{10},\frac{1}{10}\right]$$

$$H85,\ \frac{1}{A}+\frac{1}{B}+\frac{1}{C}+\frac{1}{D}+\frac{1}{E}=1,\ \left[\frac{1}{A},\frac{1}{B},\frac{1}{C},\frac{1}{D},\frac{1}{E}\right]=\left[\frac{1}{2},\frac{1}{6},\frac{1}{6},\frac{1}{7},\frac{1}{42}\right]$$

$$H86,\ \frac{1}{A}+\frac{1}{B}+\frac{1}{C}+\frac{1}{D}+\frac{1}{E}=1,\ \left[\frac{1}{A},\frac{1}{B},\frac{1}{C},\frac{1}{D},\frac{1}{E}\right]=\left[\frac{1}{2},\frac{1}{6},\frac{1}{6},\frac{1}{8},\frac{1}{24}\right]$$

$$H87,\ \frac{1}{A}+\frac{1}{B}+\frac{1}{C}+\frac{1}{D}+\frac{1}{E}=1,\ \left[\frac{1}{A},\frac{1}{B},\frac{1}{C},\frac{1}{D},\frac{1}{E}\right]=\left[\frac{1}{2},\frac{1}{6},\frac{1}{6},\frac{1}{9},\frac{1}{18}\right]$$

$$H88,\ \frac{1}{A}+\frac{1}{B}+\frac{1}{C}+\frac{1}{D}+\frac{1}{E}=1,\ \left[\frac{1}{A},\frac{1}{B},\frac{1}{C},\frac{1}{D},\frac{1}{E}\right]=\left[\frac{1}{2},\frac{1}{6},\frac{1}{6},\frac{1}{10},\frac{1}{15}\right]$$

$$H89,\ \frac{1}{A}+\frac{1}{B}+\frac{1}{C}+\frac{1}{D}+\frac{1}{E}=1,\ \left[\frac{1}{A},\frac{1}{B},\frac{1}{C},\frac{1}{D},\frac{1}{E}\right]=\left[\frac{1}{2},\frac{1}{6},\frac{1}{6},\frac{1}{12},\frac{1}{12}\right]$$

$$H90,\ \frac{1}{A}+\frac{1}{B}+\frac{1}{C}+\frac{1}{D}+\frac{1}{E}=1,\ \left[\frac{1}{A},\frac{1}{B},\frac{1}{C},\frac{1}{D},\frac{1}{E}\right]=\left[\frac{1}{2},\frac{1}{6},\frac{1}{7},\frac{1}{7},\frac{1}{21}\right]$$

$$H91,\ \frac{1}{A}+\frac{1}{B}+\frac{1}{C}+\frac{1}{D}+\frac{1}{E}=1,\ \left[\frac{1}{A},\frac{1}{B},\frac{1}{C},\frac{1}{D},\frac{1}{E}\right]=\left[\frac{1}{2},\frac{1}{6},\frac{1}{8},\frac{1}{8},\frac{1}{12}\right]$$

$$H92,\ \frac{1}{A}+\frac{1}{B}+\frac{1}{C}+\frac{1}{D}+\frac{1}{E}=1,\ \left[\frac{1}{A},\frac{1}{B},\frac{1}{C},\frac{1}{D},\frac{1}{E}\right]=\left[\frac{1}{2},\frac{1}{6},\frac{1}{9},\frac{1}{9},\frac{1}{9}\right]$$

$$H93,\ \frac{1}{A}+\frac{1}{B}+\frac{1}{C}+\frac{1}{D}+\frac{1}{E}=1,\ \left[\frac{1}{A},\frac{1}{B},\frac{1}{C},\frac{1}{D},\frac{1}{E}\right]=\left[\frac{1}{2},\frac{1}{7},\frac{1}{7},\frac{1}{7},\frac{1}{14}\right]$$

$$H94,\ \frac{1}{A}+\frac{1}{B}+\frac{1}{C}+\frac{1}{D}+\frac{1}{E}=1,\ \left[\frac{1}{A},\frac{1}{B},\frac{1}{C},\frac{1}{D},\frac{1}{E}\right]=\left[\frac{1}{2},\frac{1}{8},\frac{1}{8},\frac{1}{8},\frac{1}{8}\right]$$

$$H95,\ \frac{1}{A}+\frac{1}{B}+\frac{1}{C}+\frac{1}{D}+\frac{1}{E}=1,\ \left[\frac{1}{A},\frac{1}{B},\frac{1}{C},\frac{1}{D},\frac{1}{E}\right]=\left[\frac{1}{3},\frac{1}{3},\frac{1}{4},\frac{1}{13},\frac{1}{156}\right]$$

$$H96,\ \frac{1}{A}+\frac{1}{B}+\frac{1}{C}+\frac{1}{D}+\frac{1}{E}=1,\ \left[\frac{1}{A},\frac{1}{B},\frac{1}{C},\frac{1}{D},\frac{1}{E}\right]=\left[\frac{1}{3},\frac{1}{3},\frac{1}{4},\frac{1}{14},\frac{1}{84}\right]$$

$$H97,\ \frac{1}{A}+\frac{1}{B}+\frac{1}{C}+\frac{1}{D}+\frac{1}{E}=1,\ \left[\frac{1}{A},\frac{1}{B},\frac{1}{C},\frac{1}{D},\frac{1}{E}\right]=\left[\frac{1}{3},\frac{1}{3},\frac{1}{4},\frac{1}{15},\frac{1}{60}\right]$$

$$H98,\ \frac{1}{A}+\frac{1}{B}+\frac{1}{C}+\frac{1}{D}+\frac{1}{E}=1,\ \left[\frac{1}{A},\frac{1}{B},\frac{1}{C},\frac{1}{D},\frac{1}{E}\right]=\left[\frac{1}{3},\frac{1}{3},\frac{1}{4},\frac{1}{16},\frac{1}{48}\right]$$

$$H99,\ \frac{1}{A}+\frac{1}{B}+\frac{1}{C}+\frac{1}{D}+\frac{1}{E}=1,\ \left[\frac{1}{A},\frac{1}{B},\frac{1}{C},\frac{1}{D},\frac{1}{E}\right]=\left[\frac{1}{3},\frac{1}{3},\frac{1}{4},\frac{1}{18},\frac{1}{36}\right]$$

$$H100,\ \frac{1}{A}+\frac{1}{B}+\frac{1}{C}+\frac{1}{D}+\frac{1}{E}=1,\ \left[\frac{1}{A},\frac{1}{B},\frac{1}{C},\frac{1}{D},\frac{1}{E}\right]=\left[\frac{1}{3},\frac{1}{3},\frac{1}{4},\frac{1}{20},\frac{1}{30}\right]$$

$$H101,\ \frac{1}{A}+\frac{1}{B}+\frac{1}{C}+\frac{1}{D}+\frac{1}{E}=1,\ \left[\frac{1}{A},\frac{1}{B},\frac{1}{C},\frac{1}{D},\frac{1}{E}\right]=\left[\frac{1}{3},\frac{1}{3},\frac{1}{4},\frac{1}{21},\frac{1}{28}\right]$$

$$H102,\ \frac{1}{A}+\frac{1}{B}+\frac{1}{C}+\frac{1}{D}+\frac{1}{E}=1,\ \left[\frac{1}{A},\frac{1}{B},\frac{1}{C},\frac{1}{D},\frac{1}{E}\right]=\left[\frac{1}{3},\frac{1}{3},\frac{1}{4},\frac{1}{24},\frac{1}{24}\right]$$

$$H103,\ \frac{1}{A}+\frac{1}{B}+\frac{1}{C}+\frac{1}{D}+\frac{1}{E}=1,\ \left[\frac{1}{A},\frac{1}{B},\frac{1}{C},\frac{1}{D},\frac{1}{E}\right]=\left[\frac{1}{3},\frac{1}{3},\frac{1}{5},\frac{1}{8},\frac{1}{120}\right]$$

$$H104,\ \frac{1}{A}+\frac{1}{B}+\frac{1}{C}+\frac{1}{D}+\frac{1}{E}=1,\ \left[\frac{1}{A},\frac{1}{B},\frac{1}{C},\frac{1}{D},\frac{1}{E}\right]=\left[\frac{1}{3},\frac{1}{3},\frac{1}{5},\frac{1}{9},\frac{1}{45}\right]$$

$$H105,\ \frac{1}{A}+\frac{1}{B}+\frac{1}{C}+\frac{1}{D}+\frac{1}{E}=1,\ \left[\frac{1}{A},\frac{1}{B},\frac{1}{C},\frac{1}{D},\frac{1}{E}\right]=\left[\frac{1}{3},\frac{1}{3},\frac{1}{5},\frac{1}{10},\frac{1}{30}\right]$$

$$H106,\ \frac{1}{A}+\frac{1}{B}+\frac{1}{C}+\frac{1}{D}+\frac{1}{E}=1,\ \left[\frac{1}{A},\frac{1}{B},\frac{1}{C},\frac{1}{D},\frac{1}{E}\right]=\left[\frac{1}{3},\frac{1}{3},\frac{1}{5},\frac{1}{12},\frac{1}{20}\right]$$

$$H107,\ \frac{1}{A}+\frac{1}{B}+\frac{1}{C}+\frac{1}{D}+\frac{1}{E}=1,\ \left[\frac{1}{A},\frac{1}{B},\frac{1}{C},\frac{1}{D},\frac{1}{E}\right]=\left[\frac{1}{3},\frac{1}{3},\frac{1}{5},\frac{1}{15},\frac{1}{15}\right]$$

$$H108,\ \frac{1}{A}+\frac{1}{B}+\frac{1}{C}+\frac{1}{D}+\frac{1}{E}=1,\ \left[\frac{1}{A},\frac{1}{B},\frac{1}{C},\frac{1}{D},\frac{1}{E}\right]=\left[\frac{1}{3},\frac{1}{3},\frac{1}{6},\frac{1}{7},\frac{1}{42}\right]$$

$$H109,\ \frac{1}{A}+\frac{1}{B}+\frac{1}{C}+\frac{1}{D}+\frac{1}{E}=1,\ \left[\frac{1}{A},\frac{1}{B},\frac{1}{C},\frac{1}{D},\frac{1}{E}\right]=\left[\frac{1}{3},\frac{1}{3},\frac{1}{6},\frac{1}{8},\frac{1}{24}\right]$$

$$H110,\ \frac{1}{A}+\frac{1}{B}+\frac{1}{C}+\frac{1}{D}+\frac{1}{E}=1,\ \left[\frac{1}{A},\frac{1}{B},\frac{1}{C},\frac{1}{D},\frac{1}{E}\right]=\left[\frac{1}{3},\frac{1}{3},\frac{1}{6},\frac{1}{9},\frac{1}{18}\right]$$

$$H111,\ \frac{1}{A}+\frac{1}{B}+\frac{1}{C}+\frac{1}{D}+\frac{1}{E}=1,\ \left[\frac{1}{A},\frac{1}{B},\frac{1}{C},\frac{1}{D},\frac{1}{E}\right]=\left[\frac{1}{3},\frac{1}{3},\frac{1}{6},\frac{1}{10},\frac{1}{15}\right]$$

$$H112,\ \frac{1}{A}+\frac{1}{B}+\frac{1}{C}+\frac{1}{D}+\frac{1}{E}=1,\ \left[\frac{1}{A},\frac{1}{B},\frac{1}{C},\frac{1}{D},\frac{1}{E}\right]=\left[\frac{1}{3},\frac{1}{3},\frac{1}{6},\frac{1}{12},\frac{1}{12}\right]$$

$$H113,\ \frac{1}{A}+\frac{1}{B}+\frac{1}{C}+\frac{1}{D}+\frac{1}{E}=1,\ \left[\frac{1}{A},\frac{1}{B},\frac{1}{C},\frac{1}{D},\frac{1}{E}\right]=\left[\frac{1}{3},\frac{1}{3},\frac{1}{7},\frac{1}{7},\frac{1}{21}\right]$$

$$H114,\ \frac{1}{A}+\frac{1}{B}+\frac{1}{C}+\frac{1}{D}+\frac{1}{E}=1,\ \left[\frac{1}{A},\frac{1}{B},\frac{1}{C},\frac{1}{D},\frac{1}{E}\right]=\left[\frac{1}{3},\frac{1}{3},\frac{1}{8},\frac{1}{8},\frac{1}{12}\right]$$

$$H115,\ \frac{1}{A}+\frac{1}{B}+\frac{1}{C}+\frac{1}{D}+\frac{1}{E}=1,\ \left[\frac{1}{A},\frac{1}{B},\frac{1}{C},\frac{1}{D},\frac{1}{E}\right]=\left[\frac{1}{3},\frac{1}{3},\frac{1}{9},\frac{1}{9},\frac{1}{9}\right]$$

$$H116,\ \frac{1}{A}+\frac{1}{B}+\frac{1}{C}+\frac{1}{D}+\frac{1}{E}=1,\ \left[\frac{1}{A},\frac{1}{B},\frac{1}{C},\frac{1}{D},\frac{1}{E}\right]=\left[\frac{1}{3},\frac{1}{4},\frac{1}{4},\frac{1}{7},\frac{1}{42}\right]$$

$$H117,\ \frac{1}{A}+\frac{1}{B}+\frac{1}{C}+\frac{1}{D}+\frac{1}{E}=1,\ \left[\frac{1}{A},\frac{1}{B},\frac{1}{C},\frac{1}{D},\frac{1}{E}\right]=\left[\frac{1}{3},\frac{1}{4},\frac{1}{4},\frac{1}{8},\frac{1}{24}\right]$$

$$H118,\ \frac{1}{A}+\frac{1}{B}+\frac{1}{C}+\frac{1}{D}+\frac{1}{E}=1,\ \left[\frac{1}{A},\frac{1}{B},\frac{1}{C},\frac{1}{D},\frac{1}{E}\right]=\left[\frac{1}{3},\frac{1}{4},\frac{1}{4},\frac{1}{9},\frac{1}{18}\right]$$

$$H119,\ \frac{1}{A}+\frac{1}{B}+\frac{1}{C}+\frac{1}{D}+\frac{1}{E}=1,\ \left[\frac{1}{A},\frac{1}{B},\frac{1}{C},\frac{1}{D},\frac{1}{E}\right]=\left[\frac{1}{3},\frac{1}{4},\frac{1}{4},\frac{1}{10},\frac{1}{15}\right]$$

$$H120,\ \frac{1}{A}+\frac{1}{B}+\frac{1}{C}+\frac{1}{D}+\frac{1}{E}=1,\ \left[\frac{1}{A},\frac{1}{B},\frac{1}{C},\frac{1}{D},\frac{1}{E}\right]=\left[\frac{1}{3},\frac{1}{4},\frac{1}{4},\frac{1}{12},\frac{1}{12}\right]$$

$$H121,\ \frac{1}{A}+\frac{1}{B}+\frac{1}{C}+\frac{1}{D}+\frac{1}{E}=1,\ \left[\frac{1}{A},\frac{1}{B},\frac{1}{C},\frac{1}{D},\frac{1}{E}\right]=\left[\frac{1}{3},\frac{1}{4},\frac{1}{5},\frac{1}{5},\frac{1}{60}\right]$$

$$H122,\ \frac{1}{A}+\frac{1}{B}+\frac{1}{C}+\frac{1}{D}+\frac{1}{E}=1,\ \left[\frac{1}{A},\frac{1}{B},\frac{1}{C},\frac{1}{D},\frac{1}{E}\right]=\left[\frac{1}{3},\frac{1}{4},\frac{1}{5},\frac{1}{6},\frac{1}{20}\right]$$

$$H123,\ \frac{1}{A}+\frac{1}{B}+\frac{1}{C}+\frac{1}{D}+\frac{1}{E}=1,\ \left[\frac{1}{A},\frac{1}{B},\frac{1}{C},\frac{1}{D},\frac{1}{E}\right]=\left[\frac{1}{3},\frac{1}{4},\frac{1}{6},\frac{1}{6},\frac{1}{12}\right]$$

$$H124,\ \frac{1}{A}+\frac{1}{B}+\frac{1}{C}+\frac{1}{D}+\frac{1}{E}=1,\ \left[\frac{1}{A},\frac{1}{B},\frac{1}{C},\frac{1}{D},\frac{1}{E}\right]=\left[\frac{1}{3},\frac{1}{4},\frac{1}{6},\frac{1}{8},\frac{1}{8}\right]$$

$$H125,\ \frac{1}{A}+\frac{1}{B}+\frac{1}{C}+\frac{1}{D}+\frac{1}{E}=1,\ \left[\frac{1}{A},\frac{1}{B},\frac{1}{C},\frac{1}{D},\frac{1}{E}\right]=\left[\frac{1}{3},\frac{1}{5},\frac{1}{5},\frac{1}{5},\frac{1}{15}\right]$$

$$H126,\ \frac{1}{A}+\frac{1}{B}+\frac{1}{C}+\frac{1}{D}+\frac{1}{E}=1,\ \left[\frac{1}{A},\frac{1}{B},\frac{1}{C},\frac{1}{D},\frac{1}{E}\right]=\left[\frac{1}{3},\frac{1}{5},\frac{1}{5},\frac{1}{6},\frac{1}{10}\right]$$

$$H127,\ \frac{1}{A}+\frac{1}{B}+\frac{1}{C}+\frac{1}{D}+\frac{1}{E}=1,\ \left[\frac{1}{A},\frac{1}{B},\frac{1}{C},\frac{1}{D},\frac{1}{E}\right]=\left[\frac{1}{3},\frac{1}{6},\frac{1}{6},\frac{1}{6},\frac{1}{6}\right]$$

$$H128,\ \frac{1}{A}+\frac{1}{B}+\frac{1}{C}+\frac{1}{D}+\frac{1}{E}=1,\ \left[\frac{1}{A},\frac{1}{B},\frac{1}{C},\frac{1}{D},\frac{1}{E}\right]=\left[\frac{1}{4},\frac{1}{4},\frac{1}{4},\frac{1}{5},\frac{1}{20}\right]$$

$$H129,\ \frac{1}{A}+\frac{1}{B}+\frac{1}{C}+\frac{1}{D}+\frac{1}{E}=1,\ \left[\frac{1}{A},\frac{1}{B},\frac{1}{C},\frac{1}{D},\frac{1}{E}\right]=\left[\frac{1}{4},\frac{1}{4},\frac{1}{4},\frac{1}{6},\frac{1}{12}\right]$$

$$H130,\ \frac{1}{A}+\frac{1}{B}+\frac{1}{C}+\frac{1}{D}+\frac{1}{E}=1,\ \left[\frac{1}{A},\frac{1}{B},\frac{1}{C},\frac{1}{D},\frac{1}{E}\right]=\left[\frac{1}{4},\frac{1}{4},\frac{1}{4},\frac{1}{8},\frac{1}{8}\right]$$

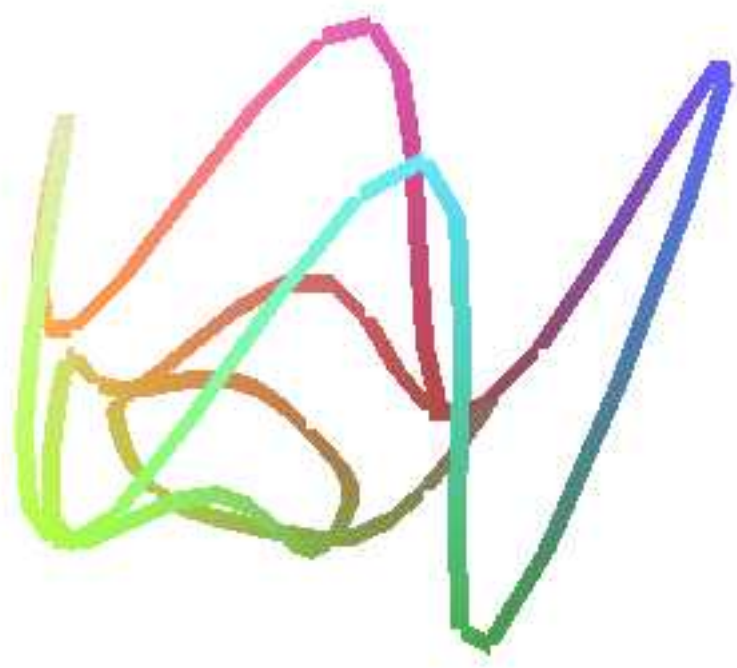
$$H131,\ \frac{1}{A}+\frac{1}{B}+\frac{1}{C}+\frac{1}{D}+\frac{1}{E}=1,\ \left[\frac{1}{A},\frac{1}{B},\frac{1}{C},\frac{1}{D},\frac{1}{E}\right]=\left[\frac{1}{4},\frac{1}{4},\frac{1}{5},\frac{1}{5},\frac{1}{10}\right]$$

$$H132,\ \frac{1}{A}+\frac{1}{B}+\frac{1}{C}+\frac{1}{D}+\frac{1}{E}=1,\ \left[\frac{1}{A},\frac{1}{B},\frac{1}{C},\frac{1}{D},\frac{1}{E}\right]=\left[\frac{1}{4},\frac{1}{4},\frac{1}{6},\frac{1}{6},\frac{1}{6}\right]$$

$$H133,\ \frac{1}{A}+\frac{1}{B}+\frac{1}{C}+\frac{1}{D}+\frac{1}{E}=1,\ \left[\frac{1}{A},\frac{1}{B},\frac{1}{C},\frac{1}{D},\frac{1}{E}\right]=\left[\frac{1}{5},\frac{1}{5},\frac{1}{5},\frac{1}{5},\frac{1}{5}\right]\qquad(1)$$

>

```
> # EQG haruhirodai by H.E:
> with(plots):
> x := 3·sin(t) − 6· sin(3·t) + sin(3· t)·sin(t): y := 3·cos(t) − 6· cos(3·t) + sin(3· t)
      ·cos(t): z := x^2·y^2: spacecurve([x, y, z], t = 0 ..2·Pi, thickness = 7, numpoints = 100);
```



```
> ?plot3d;
> ?spacecurve;
>
```

Doval 等距離円の周辺補図

H.Ebisui - 2012/03/21