

中村愿
輯錄

數學外師

下

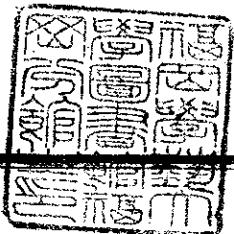
福岡第一師範學校
(學校圖書)

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T1A1

30

N 37



③ 銀出ノ甲

$$x = \text{甲}$$

$$3x = \text{乙}$$

$$12x = \text{丙}$$

$$5x = \text{丁}$$

$$21x = 73500$$

$x = 3500$
圓五三
千万

④

$$\frac{x}{3} + \frac{x}{4} = 63$$

$$4x + 3x = 63 \times 2$$

$$x = 9 \times 12$$

$$= 108$$

百
零
八

77 - x = 彼

$$\frac{x}{7} + \frac{77-x}{3} = 15$$

$$3x + 539 - 7x = 315$$

$$-4x = -224$$

$$x = 56$$

$$77 - 56 = 21$$

八十此

廿六八

一彼五

元解
之
次部
方
程
式

⑤ 6864

$$\frac{x}{4} + \frac{x}{3} = 21$$

$$3x + 4x = 21 \times 12$$

$$7x = 21 \times 12$$

$$x = 3 \times 12$$

$$= 36$$

三
十
六

6864

37
(2)

圖書和圖書通



福岡教育大学蔵

(三)

米 麥 小
 $3x + 4x + 5x = 12x$
 $12x = 72$
 $x = 6$

$3 \times 6 = 18$ 米
 $4 \times 6 = 24$ 麥
 $5 \times 6 = 30$ 小

(四)

$7x = 姉$ $6x = 妹$
 $7x - 16 = \frac{1}{2} \cdot 6x = 3x$
 $7x - 3x = +16$
 $4x = 16$
 $x = 4$

$4 \times 7 = 28$ 姉
 $4 \times 6 = 24$ 妹

(九)

$\frac{x+6}{5} + \frac{x}{3} = \frac{x+6}{3} + \frac{x}{5}$
 $3(x+6) + 5x = 5(x+6) - 3x$
 $5x = 2x + 12 - 3x$
 $(5+1)x = 12$
 $x = 2 = 乙$ $8 = 甲$

(十)

$x = 甲$ $105 - x = 乙$
 $x : 105 - x :: 3 : 4$

$x = 45$ 60
 $x = 教$ 惣

(十一)

$\frac{x}{3} - \frac{x}{10} = 175$
 $10x - 3x = 175 \times 30$
 $7x = 525$
 $x = 75$

(七)

大 小
 x $48 - x$
 $\frac{x}{6} + \frac{48 - x}{4} = 9$
 $4x + 288 - 6x = 216$
 $x = 36$
 $48 - x = 12$

(八)

$x = 長$ 棹
 $x - (\frac{x}{2} + \frac{x}{3}) = 4$
 $6x - 5x = 24$
 $x = 24$

$24 - 4 = 20$
 二 水
 丈 / 深
 ヲ

(五)

$x + \frac{1}{2}x + \frac{1}{3}x + \frac{1}{4}x = 250$
 $\frac{4x}{4} + \frac{2x}{4} + \frac{x}{4} + \frac{x}{4} = 250$
 $\frac{25}{12}x = 250$

$25x = 250 \times 12$
 $x = 120$

(六)

合割 和
 $7x + 9x = 16x$
 $16x = 2000$

$x = \frac{1000}{8}$
 $= 125$
 $7 \times 125 = 875$
 $9 \times 125 = 1125$

算學入門 卷之丁 中本流

(大)

$x = \text{資本}$

$$\frac{1488-x}{8} \quad \text{共二}$$

$$\frac{1530-x}{15} \quad \text{月ノ息}$$

$$15 \times 1488 - 15x$$

$$= 8 \times 1530 - 8x$$

$$7x = 10080$$

$$x = 1440、$$

千四百四十兩

(正)

$$x = \text{甲} \quad 204 - x = \text{乙}$$

$$x - \frac{2}{5}(204 - x) =$$

$$4(204 - x) - \frac{3}{7}x$$

$$85x - 14204 + 14x$$

$$= 282045 - 140x - 15x$$

$$204x = 31416$$

$$x = 154、$$

$$204 - 154 = 50、$$

乙 甲
五 一
十 百
個 五
 十
 四
 個

(去)

$$x = \text{書} \quad 341 - x = \text{籠}$$

$$2x - \frac{3}{8}(341 - x)$$

$$= 3(341 - x) - \frac{5}{7}x$$

$$562x - 21341 + 21x =$$

$$168341 - 168x - 40x$$

$$x = \frac{64449}{341} = 189$$

$$341 - 189 = 152$$

籠 書
價 價
百 百
五 八
十 十
二 九
圓 圓

(古)

$$(x-6)11 = 121$$

$$11x - 66 = 121$$

$$11x = 187$$

$$x = 17、$$

(五)

$$x = \text{時ノ令}$$

$$x = 24 - \frac{1}{5}x$$

$$5x = 120 - x$$

$$6x = 120$$

$$x = 20 \text{ 時止}$$

$$20 - 12 = 8$$

午後八時

美濃夕陽 卷之十一 中本藏版

(五)

$$\begin{aligned}
 x &= \text{金} & a &= \text{頭} \\
 b &= \text{脊} & c &= \text{尾} \\
 x &= a + b + c \\
 a &= 9b = 9 + c \\
 c &= 9 + \frac{1}{2}b \\
 b &= 9 + 9 + \frac{1}{2}b \\
 2b &= 18 + 18 + b \\
 b &= 36 \\
 c &= 9 + \frac{1}{2}(9 + c) \\
 2c &= 18 + 9 + c \\
 c &= 27 \\
 x &= 9 + 36 + 27 \\
 &= 72
 \end{aligned}$$

(六)

$$\begin{aligned}
 x &= \text{既} & 99 - x &= \text{未} \\
 \frac{2}{3}x &= \frac{4}{5}(99 - x) \\
 25x &= 1188 - 12x \\
 22x &= 1188 \\
 x &= 54 \\
 99 - 54 &= 45
 \end{aligned}$$

(七)

$$\begin{aligned}
 x &= \text{持所ノ初} \\
 x - \left(\frac{x}{4} + \frac{x}{5}\right) &= 66 \\
 20x - 9x &= 1320 \\
 11x &= 1320 \\
 x &= 120 \\
 &= \text{百二十圓}
 \end{aligned}$$

(八)

$$\begin{aligned}
 \frac{2}{3}(x-10) &= 80 \\
 2x - 20 &= 240 \\
 2x &= 260 \\
 x &= 130
 \end{aligned}$$

(九)

$$\begin{aligned}
 7560 &= a \times \frac{1}{x} \\
 \frac{x-a}{27} &= \frac{x-(a+2000)}{25} \\
 25x - 25a &= \\
 27x - 27a - 27 \times 2000 &= \\
 2x &= 2(x + 27000) \\
 x &= a + 27000 \\
 &= 7560 + 27000 \\
 &= 34560
 \end{aligned}$$

(十)

$$\begin{aligned}
 x &= \text{甲} & 75 - x &= \text{乙} \\
 x - (75 - x) &= \frac{x}{3} \\
 3x - 3(75 - x) &= x \\
 2x - 225 + 3x &= 0 \\
 5x &= 225 \\
 x &= 45 \\
 75 - 45 &= 30 \\
 \begin{array}{cc}
 \text{乙} & \text{甲} \\
 \text{三} & \text{四} \\
 \text{十} & \text{十五}
 \end{array} \\
 \text{(辛)} & \\
 \text{前年六} & \\
 2x - 3(x-6) &= x \\
 x - 3x + 18 &= 0 \\
 -2x &= -18 \\
 x &= 9
 \end{aligned}$$

数学外附
卷之十
三
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数学

③

$$x = \text{跡年歳}$$

$$\frac{1}{4}(x+40) = x+12$$

$$x+40 = 4x+48$$

$$3x = 8$$

$$x = \frac{8}{3} = 2 \frac{2}{3}$$

二年八个月

④

$$x = \text{甲} \quad 68 - x = \text{乙}$$

$$x - 84 = 3(68 - x - 40)$$

$$= 3(28 - x)$$

$$x - 84 = 84 - 3x$$

$$4x = 168$$

$$x = 42 = \text{甲}$$

$$68 - 42 = 26 = \text{乙}$$

⑤

$$x = \text{数某}$$

$$\frac{26+x}{45+x} = \frac{1}{2}$$

$$26 \times 2 + 2x = 45 + x$$

$$52 + 2x = 45 + x$$

$$x = -7$$

負七個

⑥

$$x = \text{甲} \quad 183 - x = \text{乙}$$

$$183 = a$$

$$\frac{4x}{7} = \frac{3(a-x)}{10}$$

$$40x = 21a - 21x$$

$$61x = 21a$$

$$= 21 \cdot 3 \cdot 61$$

$$x = 63$$

$$183 - 63 = 120$$

但シ
ナレバ
ナリ
183
ハ
六十一
ノ
三
倍

⑦

$$\frac{2}{3}x + 10 \text{ 硝} \quad \frac{1}{6}x - 45 = \text{黄} \quad \frac{2}{3 \times 7}x + \frac{10}{7} - 2 = \text{木}$$

$$\frac{2}{3}x + 10 + \frac{1}{6}x - 45 + \frac{2}{21}x + \frac{10}{7} - 2 = x$$

$$28x + 7x + 4x - 42x - 3x = -(2370 - 379 + 230)$$

$$+2237 \quad x = \frac{-3(270+20) + 3(74+79)}{-3} = 160 - 91 = 69$$

数学

算

口

木箱

(三) $x = \text{歳父}, y = \text{歳児}$
 $x = 3y$ (1) $x + 20 = 2(y + 20)$ (2)
 $3y + 20 = 2y + 40$ (3) (2) \rightarrow 移項 $x = 3y$ \rightarrow 代入
 $y = 20$ (4) (3) \rightarrow 相消ス
 $x = 60$ y \rightarrow 三倍ス

(四) $x = \text{長}, y = \text{短}$
 $x + y = 60$ (1) $\frac{1}{4}x + \frac{1}{3}y = 17$ (2)
 $3x + 4y = 204$ (3) (2) \times 分数ヲ掃フ
 $3x + 3y = 180$ (4) (1) \times 三ヲ乗ス
 $y = 24$ (5) (3) - (4)
 $4x + 4y = 240$ (6) (1) \times 四ヲ乗ス
 $x = 36$ (7) (6) - (3)

(五) $x = \text{教書年社}, y = \text{教書年幼}$
 $x + 7 = y - 7$ (1) $2(x - 7) = y + 7$ (2)
 $x - 2y = -21$ (3) (2) \rightarrow 左辺ヲ数ス

$\frac{2}{3}y + y = 1000$ (3)
 $2y + 3y = 3000$ (4)
 $5y = 3000$ (5)
 $y = 600$ (6)
 $x = 400$

ヲ得 $\frac{2}{3}y$ 分ノ一牛
 一 千ヲ
 千 ヲトシ
 ヨリ (3) ナレハ即
 六 (2) 得 (1) 一牛
 百 (3) ノ得 (2) 一牛
 ヲ減シテ (1) 牛ハ
 シテ (4) 掃テ (1) 牛
 得 (4) 三ノ和

(一) $x = \text{此}, y = \text{彼}$
 $x + y = 30$ (1)
 $x - y = 8$ (2)
 $2x = 38$ (3)
 $x = 19$ (4)
 $2y = 22$ (5)
 $y = 11$

ヲ得 (1) (1)
 得 (3) (2) (2)
 更ニ二ノ二式
 (1) 分ヘテヲ
 ヲヨリテ (3) 按
 (2) (4) \rightarrow シ

(三) $x + y = 1000$ (1) $x = \frac{2}{3}y$ (2)

多元一次方程式

中
 和
 版

$$x = 24 \quad (4)$$

$$6y = 96$$

(2) = (4) / 5倍ヲ減

$$y = 16$$

(7)

$$x + \frac{1}{2}y = 20 \quad (1)$$

(1)

$$\frac{1}{8}x + y = 20 \quad (2)$$

(2)

$$6x + 3y = 120 \quad (3)$$

(3)

(1) x 6倍

$$2x + 6y = 120 \quad (4)$$

(4)

(2) x 6倍

$$x + 3y = 60 \quad (5)$$

(5)

(4) x 半

$$5x = 60$$

(3) - (5)

$$x = 12$$

$$2x + y = 40 \quad (6)$$

(6)

(1) x 2倍

$$5y = 80$$

(2) x 4倍 = (6) x 減

$$y = 16$$

(9)

x = 得所 / 甲 y = 得所 / 乙

$$8x + 4y = 5800 \quad (1)$$

$$\frac{x}{5} + \frac{y}{10} = 220 \quad (2)$$

$$40x + 20y = 44000 \quad (3)$$

(2) x 10倍

$$y - x = 14 \quad (4)$$

(1) x 改作

$$-x = -35 \quad (5)$$

(3) - (4)

$$x = 35 \quad (6)$$

(5) x 1倍

$$y = 49 \quad (7)$$

x = 10 x 加

(六)

x = 可 y = 否

$$x + y = 12 \quad (1)$$

$$5x - 3y = 28 \quad (2)$$

$$3x + 3y = 36 \quad (3)$$

(1) x 3倍

$$8x = 64$$

(2) + (3)

$$x = 8$$

$$5x + 5y = 60 \quad (4)$$

(1) x 5倍

$$8y = 32$$

(4) - (2)

$$y = 4$$

(七)

x = 甲 y = 乙

$$4x + 3y = 144 \quad (1)$$

$$5x + 8y = 216 \quad (2)$$

$$8x + 6y = 288 \quad (3)$$

(1) x 2倍

$$3x = 72$$

(3) - (2)

$$x + \frac{y+z}{2} = 120 \quad (1)$$

$$y + \frac{x+z}{5} = 90 \quad (2)$$

$$z + x + y = 190 \quad (3)$$

$$2x + y + z = 240 \quad (4)$$

$$x = 50,$$

$$5y + x + z = 450 \quad (5)$$

$$4y = 260$$

$$y = 65,$$

$$z = 75,$$

$$x - \frac{4}{7}(y+z) = a \quad (1)$$

$$y - \frac{3}{8}(x+z) = a \quad (2)$$

$$z - \frac{2}{9}(y+x) = a \quad (3)$$

$$x = \text{甲} \quad y = \text{乙}$$

$$z = \text{丙}$$

(1) 分数ヲ乗ズ

(4) - (3)

(2) 操作ス

(5) - (3)

$$120 = a$$

↑
ス

$$15x + 20y = 26500 \quad (1) \quad (1) \times 5$$

$$25x = 17500 \quad (3) - (4)$$

$$x = 700,$$

$$y = 800,$$

$$x = \text{男} \quad y = \text{女}$$

$$x - 1 = y \quad (1) \quad x = 2(y - 1) \quad (2)$$

$$2x - 2 = 2y \quad (3) \quad (1) \times 2$$

$$x = 4 \quad (3) - (2)$$

$$y = 3 \quad (1) - (2)$$

$$2x + 3y = 105 \quad (1) \quad x = \text{弟} \quad y = \text{兄}$$

$$3x + 2y = 95 \quad (2)$$

$$4x + 6y = 210 \quad (3)$$

$$9x + 6y = 285 \quad (4)$$

$$5x = 75 \quad (5)$$

$$x = 15,$$

$$y = 25,$$

(1) = (2) 操作ス

(2) = (3) 操作ス

(4) - (3)

(5) 操作ス

(1) 分数ヲ配ス

$$x+z=6 \quad (5) \quad (2) \text{ 変作 } \times$$

$$y+z=5\frac{1}{3} \quad (6) \quad (3) \text{ 変作 } \times$$

$$2x+2y+2z=18 \quad (7) \quad (4)+(5)+(6)$$

$$x+y+z=9 \quad (8)$$

$$x=8\frac{2}{3}, \quad y=3, \quad z=2\frac{1}{3} \quad (8) \quad (8)-(5) \quad (8)-(4)$$

⑤

$$x+y+z=18 \quad (1) \quad x=\text{伯} \quad y=\text{仲}$$

$$x+y+u=16 \quad (2) \quad z=\text{叔} \quad u=\text{季}$$

$$x+z+u=14 \quad (3) \quad \text{ト}$$

$$y+z+u=12 \quad (4) \quad \text{入}$$

$$3(x+y+z+u)=60 \quad (1)+(2)+(3)+(4)$$

$$x+y+z+u=20 \quad (5)$$

$$x=8, \quad y=6, \quad (5)-(4) \quad (5)-(3) \quad (5)-(2) \quad (5)-(1)$$

$$z=4, \quad u=2$$

⑥

$$x+y=9 \quad (1) \quad x=\text{長} \quad y=\text{次}$$

$$7x-4y-4z=7a \quad (4) \quad (1) \text{ 変作 } \times$$

$$-3x+8y-8z=8a \quad (5) \quad (2) \text{ 変作 } \times$$

$$-2x-2y+9z=9a \quad (6) \quad (3) \text{ 変作 } \times$$

$$14x-8y-8z=14a \quad (7) \quad (4) \times 2 \text{ 乗 } \times$$

$$11x-11z=22a \quad (8) \quad (7)+(5)$$

$$x-z=2a \quad (9) \quad (8) \div 11 = \text{大除 } \times$$

$$-4x-4y+18z=18a \quad (10) \quad (9) \times 2 \text{ 乗 } \times$$

$$-11x+22z=11a \quad (11) \quad (10)-(4)$$

$$-x+2z=a \quad (12) \quad (11) \text{ 変作 } \times$$

$$z=3a=360, \quad (9)+(12)$$

$$x=600, \quad y=480,$$

⑦

$$6(x+y)=40 \quad (1) \quad x=\text{甲} \quad y=\text{乙}$$

$$8(x+z)=54 \quad (2) \quad z=\text{丙}$$

$$15(y+z)=80 \quad (3)$$

$$x+y=6\frac{2}{3} \quad (4) \quad (1) \text{ 変作 } \times$$

$$4x = u + x + y \quad (7) \quad \textcircled{2} \text{ 7}$$

$$3x = s \quad (8) \quad (5) + x$$

$$4y = s \quad (9) \quad (6) + y$$

$$5z = s \quad (10) \quad (7) + z$$

$$x = \frac{s}{3} - 14 \quad (11) \quad \textcircled{4} \text{ 7 } s \text{ 係 } 7 \text{ 配 } \times$$

$$60x = 20s \quad (12) \quad \textcircled{8} = 21 \text{ 7 係 } \times$$

$$60y = 15s \quad (13) \quad \textcircled{9} = 15 \text{ 7 係 } \times$$

$$60z = 12s \quad (14) \quad \textcircled{10} = 12 \text{ 7 係 } \times$$

$$60u = 20s - 840 \quad (15) \quad \textcircled{11} = 14 \text{ 7 係 } \times$$

$$60s = 67s - 840 \quad (12) + (13) + (14) + (15)$$

$$-7s = -840$$

$$s = 120$$

$$x = 40, \quad y = 30,$$

$$z = 2, \quad u = 26,$$

(8) (9) (10) (11) 7 係 \times 配 \times 係 \times 配 \times 係 \times 配 \times

⊕

$$x + 15 = \frac{4}{3}(y + 10) \quad (1) \quad x = \text{良} \quad y = \text{鶯}$$

$$y + z = 6 \quad (2) \quad s = \text{女}$$

$$x + z = 13 \quad (3) \quad x + y + z = s$$

$$2s = 28 \quad (4) \quad (1) + (2) + (3)$$

$$s = 14$$

$$s - (x + y) = 14 - 9 \quad s - (1)$$

$$z = 5$$

$$s - (y + z) = 14 - 6 \quad s - (2)$$

$$x = 8$$

$$s - (x + z) = 14 - 13 \quad s - (3)$$

$$y = 1, \quad \textcircled{5}$$

$$x = \frac{1}{2}(u + y + z) \quad (1) \quad x = \text{甲} \quad y = \text{乙}$$

$$y = \frac{1}{3}(u + x + z) \quad (2) \quad z = \text{丙} \quad u = \text{丁}$$

$$z = \frac{1}{4}(u + x + y) \quad (3) \quad x + y + z + u = s$$

$$u = x - 14 \quad (4)$$

$$2x = u + y + z \quad (5) \quad \textcircled{1} \text{ 7 係 } \times$$

$$3y = u + x + z \quad (6) \quad \textcircled{2} \text{ 7 係 } \times$$

数学
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$$7x + 2y = 711 \quad (5) \quad \textcircled{2} \text{ 各数ヲ掃フ}$$

$$3x = 243 \quad (6) \quad (5) - (4)$$

$$x = 81$$

$$2y = 468 - 324 \quad (7) \quad \textcircled{4} \text{ 各数ヲ配ク}$$

$$2y = 144$$

$$y = 72$$

Ⓢ

x = 数ノ玉手鶴阿 y = 数ノ玉手龜阿

$$x - 5 = \frac{1}{2}(y + 5) \quad (1) \quad x + 5 = 3(y - 5) \quad (2)$$

$$10 = 3y - 15 - \frac{y}{2} - \frac{5}{2} \quad (3) \quad \textcircled{2} \text{ 各数ヲ配ク}$$

$$20 = 5y - 35$$

$$y = 11$$

$$x = 13$$

Ⓣ
各数ヲ配ク
後ヲ改作ス

Ⓤ

x = 間時ク働ノ甲
 $\frac{1}{x}$ = 日一甲

y = 間時ク働ノ乙
 $\frac{1}{y}$ = 日一乙

$$3x + 45 = 4y + 40 \quad (2) \quad \textcircled{1} \text{ 各数ヲ掃フ}$$

$$3x = 4y - 5 \quad (3)$$

$$45x = 60y - 75 \quad (4) \quad \textcircled{3} = 15 \text{ 各数ヲ配ク}$$

$$x + 10 = \frac{15}{13}(y + 15) \quad (5) \quad \text{二式}$$

$$13x + 130 = 15y + 1515 \quad (6) \quad \text{二式ヲ改作ス}$$

$$13x = 15y + 95 \quad (7)$$

$$52x = 60y + 380 \quad (8) \quad \textcircled{7} = 15 \text{ 各数ヲ配ク}$$

$$7x = 455 \quad (9) \quad (8) - (4)$$

$$x = 65$$

$$y = \frac{195 + 5}{4} = 50$$

Ⓥ

$$\frac{2x + y}{3} = 78 \quad (1) \quad \text{櫻酒一函} = x$$

$$\frac{7x + 2y}{9} = 79 \quad (2) \quad \text{葡萄一函} = y$$

$$2x + y = 234 \quad (3) \quad \textcircled{1} \text{ 各数ヲ掃フ}$$

$$4x + 2y = 468 \quad (4) \quad \textcircled{3} = 2 \text{ 各数ヲ配ク}$$

文
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 一

$$\begin{aligned}
 x + \frac{2y}{3} &= 240 & (1) & \quad y + \frac{3x}{4} = 240 & (2) \\
 3x + 2y &= 3,240 & (3) & \quad (1) \text{ / 分教ヲ掃フ} \\
 3x + 4y &= 4,240 & (4) & \quad (2) \text{ / 分教ヲ掃フ} \\
 2y &= 240 & (5) & \quad (4) - (3) \\
 y &= 120 \\
 3x &= 480 & & \quad (3) \text{ / } y=120 \text{ ヲ配ス} \\
 x &= 160
 \end{aligned}$$

④

x = 数人 y = 銀出各

$$\begin{aligned}
 (x+4)(y-1) &= xy & (1) & \quad (x-3)(y+1) = xy & (2) \\
 xy + 4y - x - 4 &= xy & (3) & \quad (1) \text{ ヲ操作ス} \\
 xy - 3y + x - 3 &= xy & (4) & \quad (2) \text{ ヲ操作ス} \\
 4y - x - 4 &= 0 & (5) & \quad (3) \text{ / 位置ヲ変ス} \\
 -3y + x - 3 &= 0 & (6) & \quad (4) \text{ / 位置ヲ変ス} \\
 y - 7 &= 0 & & \quad (5) + (6) \\
 y &= 7 \\
 x &= 24 & & \quad (6) \text{ / } y=7 \text{ ヲ配ス}
 \end{aligned}$$

$$\begin{aligned}
 \frac{4}{16} &= \frac{1}{4} & & \quad \text{十六分ノ四ヲ約ス} \\
 \frac{4}{x} + \frac{4}{y} &= \frac{1}{4} & & \quad \text{問題ニ依テ移ス} \\
 \frac{36}{y} &= \frac{3}{4} & & \quad \text{移算} \\
 4 \cdot 36 &= 3y \\
 y &= 48 \\
 x &= 24 & & \quad (三)
 \end{aligned}$$

④

x = 子分 y = 母分

$$\begin{aligned}
 \frac{2x}{y+7} &= \frac{2}{3} & (1) & \quad \frac{x+2}{2y} = \frac{3}{5} & (2) \\
 6x - 2y &= 14 & (3) & \quad (1) \text{ ヲ操作ス} \\
 5x - 6y &= -10 & (4) & \quad (2) \text{ ヲ操作シ位置ヲ変} \\
 18x - 6y &= 42 & & \quad (3) \text{ / 三倍} \\
 18x &= 52 & & \quad (3) \text{ / 三倍ニ } (4) \text{ ヲ減} \\
 x &= 4 & \quad y &= 5 & \quad \therefore \frac{4}{5} \\
 x &= \text{金持所ノ甲} & \quad y &= \text{金持所ノ乙}
 \end{aligned}$$

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$$y = \frac{2x+20}{3} \quad (4)$$

(2) 7 改作ス

$$x = \frac{2x+30}{4} \quad (5)$$

(3) 7 改作ス

$$x + \frac{2x+20}{3} + \frac{2x+30}{4} = 90 \quad (6)$$

(1) 7 y を変ス

$$x = 35$$

(6) 7 改作ス

$$y = 30$$

(4) = 根ル

$$z = 25$$

(7)

$$100000 = a$$

$$4640 = b$$

$$x = 5 \quad y = 4$$

$$x + y = a \quad (1)$$

$$\frac{5x}{100} + \frac{4y}{100} = b \quad (2)$$

$$y = a - x \quad (3)$$

$$\frac{5x}{100} + \frac{4(a-x)}{100} = b \quad (4)$$

(2) 7 y を変ス

$$x = 100b - 4a$$

(4) 7 改作ス

$$x = 5400$$

即チ

$$y = 3000$$

(3) = 根ル

(8)

$$10x + y = 4x + 4y \quad (1) \quad 10x + y + 27 = x + 10y \quad (2)$$

$$2x = y \quad (3)$$

(1) 7 改作ス

$$y - x = 3 \quad (4)$$

(2) 7 改作ス

$$x = 3$$

(3) + (4)

$$y = 6$$

三十六

(9)

$$x = \text{位百} \quad y = \text{位十} \quad z = \text{位一}$$

$$x + y + z = 11 \quad (1) \quad z = 2x \quad (2)$$

$$100x + 10y + z + 297 = x + 10y + 100z \quad (3)$$

$$z - x = 3 \quad (4)$$

(3) 7 位置を移シテ

$$2x - x = 3 \quad (5)$$

(4) 7 変ス

$$x = 3$$

$$y = 2$$

$$z = 6$$

(2) = 根ル

$$x = \text{一第} \quad y = \text{二第} \quad z = \text{三第} \quad x + y + z = 90 \quad (1)$$

$$2x + 40 = 3y + 20 \quad (2) \quad 4x + 10 = 2x + 40 \quad (3)$$

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$$\frac{2x}{3} = 22 \quad (6) \quad (3) \times 2 = (32) \quad \text{7}$$

$$\frac{y}{2} = 19 \quad (7) \quad (2) \times 2 = 7$$

$$x + 19 = 30 \quad (8) \quad (1) \times 2 = 7$$

$$x = 32 \quad (5) = \text{根}$$

$$x = 33 \quad (6) = \text{根}$$

$$y = 38 \quad (7) = \text{根}$$

$$x = 11 \quad (8) =$$

$$x - y = z \quad (1) \quad (5) \quad 5y + 2z - x = 147 \quad (2)$$

$$x + y + z = 96 \quad (3)$$

$$2z = 96 \quad (4) \quad (1) + (3)$$

$$z = 48$$

$$5y + 2z = 195 \quad (5) \quad (2) \text{ 位置を交換}$$

$$y + z = 48 \quad (6) \quad (3) \text{ 右に同じ}$$

$$3y = 99 \quad (5) \text{ 右 } (6) \text{ 二倍}$$

$$y = 33$$

$$x = 15$$

$$x = \text{長} \quad y = \text{次} \quad z = \text{三} \quad u = \text{四} \quad v = \text{季}$$

$$x + \frac{y}{2} = 30 \quad (1) \quad \frac{y}{2} + \frac{z}{3} = 30 \quad (2)$$

$$\frac{2x}{3} + \frac{u}{4} = 30 \quad (3) \quad \frac{3u}{4} + \frac{v}{6} = 30 \quad (4)$$

$$\frac{5v}{6} = 30 \quad \therefore v = 36$$

$$\frac{3u}{4} = 24 \quad (5) \quad (4) \times 2 = 36 \text{ 次}$$

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$$x:18-x::5:4 \quad (2) \quad \textcircled{1} \text{ 平方に開く}$$

$$4x=90-5x$$

$$9x=90$$

$$x=10, 8,$$

$$x=\text{甲} \quad x-4=\text{乙} \quad \textcircled{4}$$

$$(2x-4)(x+2)8=1600 \quad (1)$$

$$2x^2-8x+8=200 \quad (2) \quad \textcircled{1} \text{ 前項を相乗へて除}$$

$$x^2-4x=96 \quad (3) \quad \textcircled{2} \text{ 2分の位置を乗へ}$$

$$x^2-4x+4=96+4 \quad (4) \quad \textcircled{3} \text{ 2を4分の半の自乗して両項に加へ}$$

$$x-2=\sqrt{100}$$

$$x=2\pm10$$

$$x=12, 8$$

$$x=\text{甲} \quad y=\text{乙} \quad \textcircled{5}$$

$$x-y:y::4:3 \quad (1) \quad xy^2=504 \quad (2)$$

$$3x=7y \quad (3) \quad \textcircled{1} \text{ 改作へ}$$

$$x=\text{大} \quad 14-x=\text{小} \quad \textcircled{1}$$

$$\frac{9x}{14-x} = \frac{16(14-x)}{x} \quad (1) \quad \text{問題に根を代入}$$

$$9x^2=16(14-x)^2 \quad (2) \quad \textcircled{1} \text{ 各数に標へ}$$

$$3x=4(14-x) \quad (3) \quad \textcircled{2} \text{ 平方に開く}$$

$$x=8, 6, \quad \textcircled{3} \text{ 改作へて}$$

$$(22-x)x=117 \quad (1) \quad \textcircled{1}$$

$$x^2-22x=-117 \quad (2) \quad \textcircled{1} \text{ 改作して符を変}$$

$$x^2-22x+121=4 \quad (3) \quad \textcircled{2} \text{ 2を22分の半の自乗して}$$

$$x-11=\sqrt{4}=2 \quad (4) \quad \textcircled{3} \text{ 両項を和へ}$$

$$x=11\pm2 \quad (5) \quad \textcircled{3} \text{ 第三項の外平を}$$

$$x=13, 9, \quad \textcircled{4} \text{ 位置を乗へ}$$

$$x=\text{甲} \quad 18-x=\text{乙} \quad \textcircled{5} \text{ 2を22分の半の自乗して}$$

$$x^2:(18-x)^2::25:16 \quad (1) \quad \text{負するに九へ}$$

二次方程式

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$x(2x) = 36450$ (4) (3)ノ y ヲ変ス
 $x^2 = 18225$ (5) (4)ノ前率ヲ相乗ニ
 $x = \pm 135$ 二分ス

$x + y = 10$ $y = 10 - x$
 $xy + x^2 + y^2 = 76$ (1)
 $(10 - x)x + x^2 + (10 - x)^2 = 76$ (2) (1)ノ y ヲ変ス
 $x^2 - 10x + 24 = 0$ (3) (2)ヲ改作ス
 $x^2 - 10x + 25 = 1$ (4) (3)ノ両率ニ $\frac{1}{2}$ ヲ加シ
 $x - 5 = \pm \sqrt{1}$ (4)ヲ平方ニ
 $x = 5 \pm 1$
 $x = 4, 6$

(九)
 $x = \text{長ノ杖}$ $8x = \text{長ノ地田}$ $5x = \text{廣ノ地田}$
 $4 \times 40 = 160$ \searrow ノ x ノ數
 $\frac{8x \times 5x}{160} = \frac{x^2}{4}$ (1) $\frac{1}{4}$ ノ x ノ數即四十三
約シテ $\frac{1}{4}$ ヲ得

$y^3 = 216$ (2)ノ $x = (3)$ ノ x 即チ
 $y = 6, x = 14$ $\frac{7y}{3}$ ヲ代用ス
(六)

$\frac{1}{2}x \times \frac{1}{3}x + \frac{1}{2}x = 80$ (1)
 $\frac{1}{6}x^2 + \frac{1}{2}x = 80$ (2) (1)ヲ改作ス
 $2x^2 + 6x = 80 \times 12$ (3)
 $x^2 + 3x - 180 = 0$ (4)
 $x^2 + 3x + (15)^2 - 180 = (15)^2$ (5)
 $x + 15 = \pm \sqrt{180 + 225}$ (6)
 $x = -15 \pm 135$ (7)

$x = 12, -15$ (七)
 $x = \text{豚價}$ $y = \text{豚數}$
 $x = \frac{1}{2}y$ (1)
 $2x = y$ (2)
 $xy = 36450$ (3)

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$$x+2\sqrt{xy}+y=196 \quad (5) \quad (4) \text{ノ四倍} (3) \text{ヲ加フ}$$

$$\sqrt{x}+\sqrt{y}=14 \quad (6) \quad (5) \text{ヲ平方シ}$$

$$\sqrt{x}=8 \quad (7) \quad (6) \text{ト} (2) \text{ト加シ四ノ半分}$$

$$x=64, \quad (7) \text{ヲ自乗ス}$$

$$y=36,$$

(五)

x = 失損

$$100:x::10000:100x \quad = \text{失損ノ年初}$$

$$100:x::10000:100x-x^2 \quad = \text{損ノ目年ニ}$$

$$100x-x^2=2400 \quad \text{第十問題ノ四ノ}$$

(五)

x = 教題

$$x^2=35x+x+800+32 \quad (1)$$

$$x^2-36x+(18)^2=832+(18)^2 \quad (2) \quad (1) \text{ノ位置ヲ}$$

$$x-18=\pm\sqrt{1156}$$

$$x=18\pm34$$

$$x=52,$$

(18)ヲ加フ

$$\frac{x^2}{4} \times 8 = 13 \times 28 \quad (2) \quad 26 \text{ノ四地四方ノ長}$$

$$x^2=13 \times 13 \quad (3) \quad (2) \text{ノ前率ヲ相乘シ而シテ}$$

$$x=13$$

$$8x=104,$$

$$5x=65,$$

(十)

x = 價買

$$-x^2+100x=2400 \quad (1)$$

$$x^2-100x=-2400 \quad (2) \quad (1) \text{ノ符ヲ変ス}$$

$$x^2-100x+(50)^2=(50)^2+2400 \quad (3) \quad (2) \text{ノ兩率ニ} 50 \text{ヲ加フ}$$

$$x-50=\pm\sqrt{100}$$

$$x=50\pm10$$

$$x=60, \quad 40,$$

(十)

$$x=\text{甲} \quad y=\text{乙}$$

$$x+y=100 \quad (1) \quad \sqrt{x}-\sqrt{y}=2 \quad (2)$$

$$x-2\sqrt{xy}+y=4 \quad (3)$$

$$\sqrt{xy}=48 \quad (4)$$

(2)ヲ自乗ス
(1)ヨリ(3)ヲ減シ折半ス

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$$x = 8 \pm 2$$

$$x = 10, 6,$$

(去)

x = 價買

$$100 : x :: x : \frac{x^2}{100} \quad (1) \quad \text{問 = 依 } \tau$$

$$x + \frac{x^2}{100} = 24 \quad (2) \quad \text{賣 = 價}$$

$$100x + x^2 = 2400 \quad (3) \quad \text{(2) 分數ヲ掃}$$

$$x^2 + 100x + 50^2 = 2400 + 2500,$$

$$x + 50 = \pm \sqrt{4900}$$

$$x = -50 \pm 70$$

$$x = 20,$$

(去)

x = 數 / 卵 / 甲 $100 - x$ = 數 / 卵 / 乙

$$\frac{18}{100 - x} = \text{價個一卵 / 甲} \quad \frac{8}{x} = \text{價 / 個一卵 / 乙}$$

$$\frac{18x}{100 - x} = \frac{8(100 - x)}{x} \quad (1)$$

$$9x^2 = 4(100 - x)^2 \quad (2) \quad \text{(1) 分數ヲ掃川分}$$

(去)

x = 數人 / 男 $20 - x$ = 數人 / 女

$$x + y = 20 \quad (1) \quad \frac{24}{x} - 1 = \frac{24}{20 - x} \quad (2)$$

$$(20 - x) \left(\frac{24}{x} - 1 \right) = 24 \quad (3) \quad \text{(2) 分數ヲ掃}$$

$$(20 - x)24 - 20x + x^2 = 24x \quad (4) \quad \text{(3) 18xヲ移}$$

$$480 - 24x - 20x + x^2 = 24x \quad (5)$$

$$x^2 - 68x + (34)^2 = 676 \quad (6)$$

$$x - 34 = \pm \sqrt{676}$$

$$x = 34 \pm 26$$

$$x = 8, \quad 20 - 8 = 12,$$

(去)

x = 一茅 $x + 4$ = 二茅 y = 三茅

$$x + (x + 4) + y = 30 \quad (1) \quad 2x + y = 26 \quad (2)$$

$$x^2 + (x^2 + 8x + 16 + 4x^2 - 104x + 676) = 332 \quad (3) \quad \text{(2) 分數ヲ掃}$$

$$6x^2 - 96x + 360 = 0 \quad (4) \quad \text{(3) 分數ヲ掃}$$

$$x = 8 \pm \sqrt{64 - 60}$$

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$$x^2 - 2x + 35 = 0$$

(3) 十字分解

$$x^2 - 2x + 1 = 36$$

$$x - 1 = \pm\sqrt{36}$$

$$x = 1 \pm 6$$

$$x = 7$$

(4)

$$x^2 + 18x - 140 = 0$$

(1)

$$4x^2 + 52x + 169 = 729$$

(2)

(1) 四乗に
二、自乗して加

$$2x + 13 = \pm 27$$

$$x = 7 \quad -20$$

七回借田

(5)

$$x = \text{甲} \quad y = \text{乙} \quad x + y = 6 \quad (1) \quad x^2 + y^2 = 20 \quad (2)$$

$$x^2 + 2xy + y^2 = 36 \quad (3)$$

(1) 自乗

$$-2xy = -16 \quad (4)$$

(2) - (8)

$$x^2 - 2xy + y^2 = 4 \quad (5)$$

(2) + (4)

$$x - y = \pm 2 \quad (6)$$

(5) 平方、開

$$2x = 8 \quad (7)$$

(1) + (6)

$$3x = 2(100 - x)$$

$$x = 40, \quad 100 - x = 60$$

(6)

$$x^2 - 7 = \text{教某}$$

$$\sqrt{x^2 - 7} + 7 = x$$

$$\sqrt{x^2 - 7} + 16 = \frac{-\sqrt{x^2 + 9}}{x + \sqrt{x^2 + 9} = 9} (+)$$

$$x^2 + 9 = (9 - x)^2 = 81 - 18x + x^2$$

$$18x = 81 - 9 = 72$$

$$x = 4$$

$$x^2 - 7 = 9$$

(7)

$$x = \text{教人} \quad y = \text{借人} = \frac{175}{x-2}$$

$$\frac{175}{x-2} = \frac{175}{x} - 10 \quad (1)$$

$$175 = (x-2) \frac{175}{x} - 10x + 20 \quad (2)$$

(1) 移

$$10x^2 - 20x + 350 = 0 \quad (3)$$

(2) 移

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$$x = 8 \pm 2$$

$$x = 10, 6,$$

(夫)

x = 價買

$$100 : x :: x : \frac{x^2}{100} \quad (1) \quad \text{問 = 依 } \frac{1}{x}$$

$$x + \frac{x^2}{100} = 24 \quad (2) \quad \text{賣 = 價}$$

$$100x + x^2 = 2400 \quad (3) \quad \text{(2) \text{の} 分數 \text{ヲ} 掃}$$

$$x^2 + 100x + 50^2 = 2400 + 2500,$$

$$x + 50 = \pm \sqrt{4900}$$

$$x = -50 \pm 70$$

$$x = 20,$$

(士)

x = 數 / 卵 / 甲 $100 - x$ = 數 / 卵 / 乙

$$\frac{18}{100 - x} = \text{價個一卵 / 甲} \quad \frac{8}{x} = \text{價 / 個一卵 / 乙}$$

$$\frac{18x}{100 - x} = \frac{8(100 - x)}{x} \quad (1)$$

$$9x^2 = 4(100 - x)^2 \quad (2) \quad \text{(1) \text{の} 分數 \text{ヲ} 掃}$$

(吉)

x = 數人 / 男 $20 - x$ = 數人 / 女

$$x + y = 20 \quad (1) \quad \frac{24}{x} - 1 = \frac{24}{20 - x} \quad (2)$$

$$(20 - x) \left(\frac{24}{x} - 1 \right) = 24 \quad (3) \quad \text{(2) \text{の} 分數 \text{ヲ} 掃}$$

$$(20 - x)24 - 20x + x^2 = 24x \quad (4) \quad \text{(3) \text{の} 分數 \text{ヲ} 掃}$$

$$480 - 24x - 20x + x^2 = 24x \quad (5)$$

$$x^2 - 68x + (34)^2 = 676 \quad (6)$$

$$x - 34 = \pm \sqrt{676}$$

$$x = 34 \pm 26$$

$$x = 8, \quad 20 - 8 = 12,$$

(五)

x = 一第 $x + 4$ = 二第 y = 三第

$$x + (x + 4) + y = 30 \quad (1) \quad 2x + y = 26 \quad (2)$$

$$x^2 + (x^2 + 8x + 16 + 4x^2 - 104x + 676) = 332 \quad (3) \quad \text{(1) \text{の} 分數 \text{ヲ} 掃}$$

$$6x^2 - 96x + 360 = 0 \quad (4) \quad \text{(3) \text{の} 分數 \text{ヲ} 掃}$$

$$x = 8 \pm \sqrt{64 - 60}$$

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$$x^2 - 2x + 35 = 0$$

(3) 十字分解

$$x^2 - 2x + 1 = 36$$

$$x - 1 = \pm\sqrt{36}$$

$$x = 1 \pm 6$$

$$x = 7$$

(4)

$$x^2 + 18x - 140 = 0$$

(1)

$$4x^2 + 52x + 169 = 729$$

(2)

(1) 四乗に
二、自乗して加

$$2x + 13 = \pm 27$$

$$x = 7 \quad -20$$

七回借田

(5)

$$x = \text{甲} \quad y = \text{乙} \quad x + y = 6 \quad (1) \quad x^2 + y^2 = 20 \quad (2)$$

$$x^2 + 2xy + y^2 = 36 \quad (3)$$

(1) 自乗

$$-2xy = -16 \quad (4)$$

(2) - (8)

$$x^2 - 2xy + y^2 = 4 \quad (5)$$

(2) + (4)

$$x - y = \pm 2 \quad (6)$$

(5) 平方、開

$$2x = 8 \quad (7)$$

(1) + (6)

$$3x = 2(100 - x)$$

$$x = 40, \quad 100 - x = 60$$

(6)

$$x^2 - 7 = \text{教某}$$

$$\sqrt{x^2 - 7} + 7 = x$$

$$\sqrt{x^2 - 7} + 16 = \frac{-\sqrt{x^2 + 9}}{x + \sqrt{x^2 + 9} = 9} (+)$$

$$x^2 + 9 = (9 - x)^2 = 81 - 18x + x^2$$

$$18x = 81 - 9 = 72$$

$$x = 4$$

$$x^2 - 7 = 9$$

(7)

$$x = \text{教人} \quad y = \text{借人} = \frac{175}{x-2}$$

$$\frac{175}{x-2} = \frac{175}{x} - 10 \quad (1)$$

$$175 = (x-2) \frac{175}{x} - 10x + 20 \quad (2)$$

(1) 移

$$10x^2 - 20x + 350 = 0 \quad (3)$$

(2) 移

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$w = \text{數里ノ時毎}$ ③ $\frac{36}{w} = \text{數ノ時}$
 $\frac{36}{w} = \frac{36}{w+1} + 3$ (1)
 $w^2 + w = 12$ ④ $\frac{675}{w} = \text{價ノドヤ}$
 $w^2 + w + (5)^2 = 12 + (5)^2$
 $w + 5 = \pm 12,25$
 $w = -5 \pm 8,5$
 $w = 3$
 $w = \text{數ノドヤ}$
 $4,80w = 6750 + \frac{6750}{w}$
 $4,80w^2 - 6750w = 6750$
 $1,60w^2 - 2250w = 2250$
 $16w^2 - 225w = 225$
 $w = 15$
 $w = \text{價ノ入買}$ ⑤ $\frac{w}{100} = \text{利ノ一分百}$

$w = 4$
 $2y = 4$ (1) — (6)
 $y = 2$ ⑥
 $w = \text{度尺}$
 $8x : 4x :: 7w : \frac{28w^2}{8w} = \frac{7w}{2}$
 $5w \times 4w = 20w^2$
 $20w^2 \times \frac{7}{2}w = 70w^3 = \text{積金ノ草}$
 $70w^3 \times 4w = 224 \times 20w^3$ (1)
 $w^2 = 16$ ⑦ $280w^2$ 進ノ
 $w = 4$
 $5w = 20$ $4w = 16$ $\frac{7}{2}w = 14$
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$$x^2 + 7x + 32 = 19x$$

$$x^2 - 12x = -32$$

$$x = 6 \pm 2$$

$$x = 8 \quad 19x = 152$$

$$(x-y)(x^2+y^2) = 32 \quad (1) \quad (x+y)(x^2+y^2) = 272 \quad (2)$$

$$x^3 - x^2y - xy^2 + y^3 = 32 \quad (3)$$

$$x^3 + x^2y + xy^2 + y^3 = 272 \quad (4)$$

$$2x^2y + 2xy^2 = 240 \quad (5) \quad (3)-(4)$$

$$3x^2y + 3xy^2 = 360 \quad (6) \quad (5) \times 3/2$$

$$2x^3 + 2y^3 = 304 \quad (7) \quad (3)+(4)$$

$$x^3 + y^3 = 152 \quad (8) \quad (7) \div 2$$

$$x^3 + 3x^2y + 3xy^2 + y^3 = 512 \quad (9) \quad (6)+(8)$$

$$(x+y)^3 = 512 \quad (10)$$

$$x+y = 8 \quad (11)$$

$$y = 8 - x \quad (12)$$

$$3x^2y + 3xy^2 = 360 \quad (13) \quad (9)-(10)$$

$$\frac{w^2}{100} = \text{利ノノ全}$$

$$w + \frac{w^2}{100} = 39$$

$$w^2 + 100w = 3900$$

$$w + 50 = \sqrt{3900 + (50)^2}$$

$$w = -50 \pm 80$$

$$w = 30 \quad \text{川十圓}$$

$$w = \text{数日} \quad 396 - 216 = 180 = \text{数里歩乙}$$

$$\frac{216}{w} = \text{力速ノ日甲} \quad \frac{180}{w} = \text{力速ノ日毎乙}$$

$$w = \frac{216}{w} - \frac{180}{w} \quad (1)$$

$$w^2 = 36 \quad (2) \text{一分數ヲ持テ}$$

$$w = 6 \quad \text{甲} = 36 \quad \text{乙} = 30$$

$$w = \text{力速ノ日乙} \quad 10 = \text{離距ノ地面}$$

$$w^2 = \text{数里ノ乙速會} \quad 7w + 32 = \text{数ノ甲速會}$$

算術十段

$x:y::x+y:42$ (1) $x:y::x-y:6$ (2)

$x+y:42::x-y:6$ (3)

$(x+y)+(x-y):(x+y)-(x-y)::42+6:42-6$ (4)

$2x:2y::48:36$ (5) (4) 改作 \times 比

$x:y::24:18$ (6) (5) \div 二分 \times 例式

$x:y::4:3$ (7) (6) 後節 \div 六除

$4:3::x+y:42$ (8) (7) 後節 \div 前節 \times

$4:3::x-y:6$ (9) (8) 後節 \div 後節 \times

$x+y=56$ (10) (9) 後節 \div 用 \times

$x-y=8$ (11) (10) 改作 \times

$x=32$ (10) (11) 加 \div 二分 \times

$y=24$ (10) (11) 減 \div 二分 \times

三

初 次 末
 $x + xy + xy^2 = 52$ (1)

$xy^2 + x : xy :: 10 : 3$ (2)

$3xy(x+y) = 360$ (14)

$3xy \times 8 = 360$ (15)

$24xy = 360$ (16)

$xy = 15$ (17) (16) \div 二十四 \div 餘

$x(8-x) = 15$ (18) $y \div$ (12) \div 変 \times

$8x - x^2 = 15$ (19)

$x^2 - 8x = -15$ (20) (19) 位置 \div 変

$x^2 - 8x + 4^2 = 4^2 - 15$

$x - 4 = \pm 1$

$x = 4 \pm 1$

$x = 5, 3$

$y = 3, 5$

算術十段

三

三

算術十段

$$xy = 112 \quad (1) \quad \text{III} \quad x^2 - y^2 : x - y^2 :: 31 : 3 \quad (2)$$

$$\frac{x^3 - y^3}{x - y} : \frac{x - y^3}{x - y} :: 31 : 3 \quad (3)$$

$$x^2 + xy + y^2 : x^2 - 2xy + y^2 :: 31 : 3 \quad (4) \quad \text{③ 除分母}$$

$$(x^2 + xy + y^2) - (x^2 - 2xy + y^2) : (x - y)^2 :: 31 - 3 : 3 \quad (4)$$

$$3xy : (x - y)^2 :: 28 : 3 \quad (5) \quad \text{④ 7 改作 x}$$

$$336 : (x - y)^2 :: 28 : 3 \quad (6) \quad \text{⑤ } \frac{1}{3} \text{ 7 (1) 変}$$

$$(x - y)^2 = 36 \quad (7) \quad \text{⑥ 7 改作 x}$$

$$x - y = 6 \quad (8) \quad \text{⑦ 7 開}$$

$$y = \frac{112}{x} \quad (9) \quad \text{⑧ 1 変}$$

$$x - \frac{112}{x} = 6 \quad (10) \quad \text{⑧ } \frac{1}{x} = \text{⑨ 変}$$

$$x^2 - 112 = 6x \quad (11) \quad \text{⑩ 7 改作 x}$$

$$x^2 - 6x - 112 = 0 \quad (11) \quad \text{⑪ 1 変置 7 変}$$

$$x = 3 \pm \sqrt{\frac{36}{4} + 112} \quad \text{二次方程式}$$

$$x = 3 \pm 11$$

$$\therefore x = 14 \quad y = 8$$

$$y^2 + 1 : y :: 10 : 3 \quad (3)$$

② 前節 x = 7 除

$$y^2 + 1 : 2y :: 10 : 6 \quad (4)$$

③ 1 除 10 變

$$(y^2 + 1) + (2y) : (y^2 + 1) - (2y) :: 10 + 6 : 10 - 6 \quad (5)$$

$$y^2 + 2y + 1 : y^2 - 2y + 1 :: 16 : 4 \quad (6) \quad \text{⑤ 改作 x}$$

$$(y + 1)^2 : (y - 1)^2 :: 4^2 : 2^2 \quad (7) \quad \text{⑥ 7 約}$$

$$y + 1 : y - 1 :: 4 : 2 \quad (8) \quad \text{⑦ 7 開}$$

$$(y + 1) + (y - 1) : (y + 1) - (y - 1) :: 4 + 2 : 4 - 2 \quad (9)$$

$$2y : 2 :: 6 : 2 \quad (10) \quad \text{⑨ 7 改作 x}$$

$$y : 1 :: 3 : 1 \quad (11) \quad \text{⑩ 7 二分}$$

$$y = 3$$

$$x + x \times 3 + x \times 3^2 = 52 \quad (12) \quad \text{⑪ } \frac{1}{x} = \text{⑫ 変}$$

$$x(1 + 3 + 9) = 52 \quad (13)$$

$$x = \frac{52}{15} = 4$$

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(六)

$$x+4:y+4::3:4 \quad (1) \quad x-4:y-4::1:4 \quad (2)$$

$$4(x-4)=y-4 \quad (3) \quad (2) \text{ 代入}$$

$$y=4(x-4)+4 \quad (4)$$

$$x+4:4(x-4)+4+4::3:4 \quad (5)$$

$$x+4:4x-16+8::3:4 \quad (6) \quad (5) \text{ 代入}$$

$$x+4:4(x-2)::3:4 \quad (7)$$

$$x+4:x-2::3:1 \quad (8) \quad (7) \text{ 後部を}$$

$$(x+4)+(x-2):(x+4)-(x-2)::3+1:3-1 \quad (9) \quad \text{除く}$$

$$2x+2:6::4:2 \quad (10) \quad (9) \text{ 代入}$$

$$x+1:3::2:1 \quad (11) \quad (10) \text{ 代入}$$

$$x+1=6 \quad \therefore x=6-1=5$$

$$5-4:y=4::1:4 \quad (12) \quad (2) \text{ 代入}$$

$$1:y-4::1:4$$

$$y-4=4$$

$$y=4+4=8$$

(五)

$$x-y:x+y::2:9 \quad (1) \quad x+y:xy::18:77 \quad (2)$$

$$(x+y)+(x-y):(x+y)-(x-y)::9+2:9-2 \quad (3)$$

$$2x:2y::11:7 \quad (4) \quad (3) \text{ 改作}$$

$$x:y::11:7 \quad (5) \quad (4) \text{ 前部を}$$

$$x = \frac{11y}{7} \quad (6)$$

$$\frac{11y}{7} + y : \frac{11y}{7} \times y :: 18:77 \quad (7) \quad (2) \text{ へ } (6) \text{ 代入}$$

$$\frac{18y}{7} : \frac{11y^2}{7} :: 18:77 \quad (8) \quad (7) \text{ 代入}$$

$$18y:11y^2::18:77 \quad (9) \quad (8) \text{ 前部を}$$

$$18:11y::18:77 \quad (10) \quad (9) \text{ 代入}$$

$$1:11y::1:77 \quad (11)$$

$$y=7$$

$$x:7::11:7 \quad (12) \quad (5) \text{ 代入}$$

$$x:1::11:1 \quad (13)$$

$$x=11$$

算術
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$$x^2 + xy + y^2 : x^2 - 2xy + y^2 :: 61 : 1 \quad (5)$$

$$x^2 + xy + y^2 - x^2 + 2xy - y^2 : (x-y)^2 :: 61 - 1 : 1 \quad (6)$$

$$3xy : (x-y)^2 :: 60 : 1 \quad (7) \quad (6) \rightarrow \text{改作}$$

$$960 : (x-y)^2 :: 60 : 1 \quad (8) \quad (7) \rightarrow \text{代}$$

$$16 : (x-y)^2 :: 1 : 1 \quad (9) \quad (8) \rightarrow \text{六十一除}$$

$$4 : (x-y) :: 1 : 1 \quad (10) \quad (9) \rightarrow \text{平方}$$

$$x - y = 4 \quad (11) \quad (10) \rightarrow \text{改作}$$

$$x - \frac{320}{x} = 4 \quad (12) \quad (11) \rightarrow \text{代}$$

$$x^2 - 320 = 4x \quad (13) \quad (12) \rightarrow \text{分教掃}$$

$$x^2 - 4x - 320 = 0 \quad (14) \quad \text{以下二次方程式}$$

$$x^2 - 4x + 2^2 = 320 + 4$$

$$x - 2 = \pm \sqrt{324}$$

$$x = 2 \pm 18$$

$$x = 20$$

$$y = 18 - 2 = 16$$

(5)

$$x + y = 27 \quad (1) \quad xy : x^2 + y^2 :: 20 : 41 \quad (2)$$

$$2xy : x^2 + y^2 :: 40 : 41 \quad (3) \quad (2) \rightarrow \text{両辺乗入}$$

$$x^2 + 2xy + y^2 : x^2 - 2xy + y^2 :: 81 : 1 \quad (4) \quad \text{加}$$

$$(x+y)^2 : (x-y)^2 :: 9^2 : 1^2 \quad (5) \quad (4) \rightarrow \text{括入}$$

$$x+y : x-y :: 9 : 1 \quad (6) \quad (5) \rightarrow \text{開}$$

$$(x+y) + (x-y) : (x+y) - (x-y) :: 9+1 : 9-1 \quad (7)$$

$$2x : 2y :: 10 : 8 \quad (8) \quad (7) \rightarrow \text{倍入}$$

$$x : y :: 5 : 4 \quad (9)$$

$$x : 27 - x :: 5 : 4 \quad (10) \quad (9) \rightarrow \text{代}$$

$$4x = 135 - 5x \quad (11)$$

$$9x = 135$$

$$x = 15 \quad 27 - 15 = 12 = y$$

(2)

$$xy = 320 \quad (1) \quad y = \frac{320}{x} \quad (2)$$

$$x^2 - y^2 : (x-y)^2 :: 61 : 1 \quad (3)$$

$$x^2 - y^2 : x - y : (x-y)^2 : x - y :: 61 : 1 \quad (4)$$

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$2x+12:2y-12::3:1$ (6) (5)ヲ改作ス

$x+6:y-6::3:1$ (7) (6)ノ前節ヲ二分ス

$x+6:\frac{2x}{3}-6::3:1$ (8) (7)ノ y ヲ(1)ニ代フ

$x+6:2x-18:3:3$ (9) (8)ニ依ル

$x+6:2(x-9)::1:1$ (10) (9)ノ後節ヲ二分ス

$x+6=2(x-9)$ (11) (10)ニ依ル

$x=2x-18-6$ (12) 即チ

$-x=-24$

$x=24$

$24:y::3:2$ (1)ノ x ヲ(24)ニ代フ

$y=16$

(H)

$x:x::x:y$ (1) $x:24::24:y$ (2)

$y=\frac{24^2}{x}$ (3) $x:y::16:9$ (4)

$x:\frac{(24)^2}{x}::16:9$ (5) (4)ノ y ヲ(3)ニ代フ

$x^2:(24)^2::16:9$ (6) (5)ヲ改作ス

(Z)

$x+y=60$ (1) $y=60-x$ (2)

$xy:x^2+y^2::2:5$ (3)

$2xy:x^2+y^2::4:5$ (4) (3)ノ両前率ヲ倍ス

$x^2+2xy+y^2:x^2-2xy+y^2::$ (4)ノ前節

$4+5:5-4$ (5) 後節共ニ和差ヲ作ル

$(x+y)^2:(x-y)^2::9:1$ (6) 括ル

$x+y:x-y::3:1$ (7) 開ク

$60:x-60+x::3:1$ (8) (7)ノ y ヲ(1)ニ代フ

$10:x-30::1:1$ (9) (8)ノ両前率ヲ三ニテ除ク

$10=x-30$

$x=40$ $y=60-40=20$ 又前節ヲ二分ス

(T)

$x:y::3:2$ (1) $(x+6)+(y-6):(x+6)-(y-6)::3:1$ (2)

$x+6+y-6:x+6-y+6::3:1$ (3)

$x+y:x-y+12::3:1$ (4)

$x+y+x-y+12:x+y-x+y-12::3:1$ (5)

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$$x - y = 20 \quad x = 20 + y \quad y = x - 20$$

$$20 : y :: 100 : 20 + y \quad (5) \quad (1) \text{ノ 兩外邊ヲ代テ}$$

$$y : 20 + y :: 1 : 5 \quad (6) \quad (5) \text{ノ 柱ヲ變之ニ十}$$

$$y : 20 :: 1 : 4 \quad \text{ニテ 除}$$

$$y = 5、$$

$$x - 5 : 1 :: 20 : 1$$

$$x = 25、$$

(四)

$$x^3 + y^3 : x^3 - y^3 :: 559 : 127 \quad (1) \quad x^2 y = 294$$

$$x^3 + y^3 + x^3 - y^3 : x^3 + y^3 - x^3 + y^3 ::$$

$$559 + 127 : 559 - 127 \quad (3)$$

$$2x^3 : 2y^3 :: 686 : 432 \quad (4) \quad (3) \text{ヲ 改作ス}$$

$$x^3 : y^3 :: 343 : 216 \quad (5) \quad (4) \text{ヲ 二分ス}$$

$$x : y :: 7 : 6 \quad (5) \text{ヲ 立方ニ開}$$

$$6x = 7y$$

$$6x \times x^2 = 294$$

$$x = 7、 \quad y = 6、$$

$$x : 24 :: 4 : 3$$

$$x = 32、 \quad 32 : y :: 16 : 9 \quad y = 18、$$

(五)

$$x + y : x - y :: 4 : 1 \quad (1) \quad x^2 + y^2 : x :: 102 : 5 \quad (2)$$

$$x + y + x - y : x + y - x + y :: 4 + 1 : 4 - 1 \quad (3)$$

$$2x : 2y :: 5 : 3 \quad (4) \quad (3) \text{ヲ 改ス}$$

$$x : y :: 5 : 3 \quad (5) \quad (4) \text{ノ 前節ヲ 二分ス}$$

$$x = \frac{5y}{3} \quad (6)$$

$$\frac{25}{9}y^2 + y^2 : \frac{5}{3}y :: 102 : 5 \quad (7) \quad (2) \text{ノ 左ヲ (6)ニ代}$$

$$34y^2 : 9y :: 34 : 1 \quad (8) \quad (7) \text{ヲ 改作ス}$$

$$y : 9 :: 1 : 1 \quad (9)$$

$$y = 9、 \quad x = \frac{5 \times 9}{3} = 15、$$

(五)

$$x - y : y :: 100 : x \quad (1) \quad x - y : x :: 4 : y \quad (2)$$

$$(x - y)^2 : xy :: 400 : xy \quad (3) \quad (1) \text{ノ 各邊ヲ 乘ス}$$

$$x - y : 1 :: 20 : 1 \quad (4) \quad (3) \text{ヲ 開キ 又 (2)ニ 除}$$

中
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二

b = 率末 s = 計總

$$\begin{aligned}
 b &= a + (n-1)d \\
 &= 5 + (24-1)3 \\
 &= 5 + (23 \times 3) \\
 &= 74 \\
 s &= \frac{n}{2}(a+b) \\
 &= \frac{24}{2}(5+74) \\
 &= 12 \times 79 \\
 &= 978
 \end{aligned}$$

ル式 知テ末率の總數ヲ求ム 初率 a 段數 n 及ヒ差 d ヲ

塚術

三

$$\begin{aligned}
 b &= a + (n-1)d & s &= \frac{n}{2}(a+b) \\
 &= 7 + (36-1)3 & &= \frac{36}{2}(7+112) \\
 &= 7 + 105 & &= 18 \times 119 \\
 &= 112 & &= 2142
 \end{aligned}$$

五

$$(x+1)^4 : (x-1)^4 :: 2(x+1)^2 : (x-1)^2 \cdot (1)$$

$$\begin{aligned}
 x+1 &: x-1 :: \sqrt{2} : 1 \\
 x+1 &= x\sqrt{2} - \sqrt{2} \\
 \sqrt{2}+1 &= x\sqrt{2} - x \\
 \frac{\sqrt{2}+1}{x} &= \sqrt{2}-1 \\
 x &= \frac{\sqrt{2}+1}{\sqrt{2}-1}
 \end{aligned}$$

六

$$\begin{aligned}
 a+b+c+d : a-b+c-d :: a+b-c-d : a-b-c+d \\
 2a+2c : 2b+2d :: 2a-2c : 2b-2d \\
 a+c : b+d :: a-c : b-d \\
 a+c : a-c :: b+d : b-d \\
 a : c :: b : d \\
 a : b :: c : d
 \end{aligned}$$

$$\begin{aligned} d &= \frac{2(nv-s)}{n(n-1)} \\ &= \frac{2(11 \times 44 - 264)}{11 \times 10} \\ &= \frac{220 \times 2}{110} \\ &= 4, \end{aligned}$$

$$\begin{aligned} a &= \frac{2s}{n} - v \\ &= \frac{528}{11} - 44 \\ &= \frac{44}{11} \\ &= 4, \end{aligned}$$

$$\begin{aligned} d &= \frac{2(nv-s)}{n(n-1)} \\ &= \frac{2(\frac{1}{4}v \times v - \frac{2}{7}3542)}{\frac{1}{4}v(\frac{1}{4}v-1)} \\ &= \frac{2(\frac{1}{4}88 \times 88 - 1012)}{\frac{1}{4}88(\frac{1}{4}88-1)} \\ &= \frac{2(22 \times 88 - 1012)}{22 \times 21} \\ &= \frac{22 \times 88 - 1012}{11 \times 21} \\ &= \frac{924}{231} = 4, \end{aligned}$$

八

$$\begin{aligned} n &= \frac{b-a}{d} + 1 \\ &= \frac{31-1}{1} + 1 \\ &= 31, \end{aligned}$$

求 n, a
s, 知 d
7, 7, b

$$\begin{aligned} s &= a + (n-1)d \\ &= 1 + (48-1)2 \\ &= 1 + 94 \\ &= 95, \end{aligned}$$

$$\begin{aligned} d &= \frac{b-a}{n-1} \\ &= \frac{37-7}{6-1} \\ &= \frac{30}{5} \\ &= 6, \end{aligned}$$

$$\begin{aligned} s &= \frac{(b+a)(b-a+d)}{2d} \\ &= \frac{(31+1)(31-1+1)}{2 \times 1} \\ &= \frac{32 \times 31}{2} \\ &= 496, \end{aligned}$$

$$\begin{aligned} s &= \frac{n}{2}(2a + (n-1)d) \\ &= \frac{48}{2}(1 \times 2 + (48-1)2) \\ &= 24(2 + 94) \\ &= 2304, \end{aligned}$$

$$\begin{aligned} s &= \frac{n}{2}(a+b) \\ &= \frac{6}{2}(7+37) \\ &= 3 \times 44 \\ &= 132, \end{aligned}$$

$$s = \frac{(a+z)(z+d-a)}{2d}$$

$$= \frac{(2+58)(58+2-2)}{2 \times 2}$$

$$= \frac{60 \times 58}{40}$$

$$= 870$$

$$n = \frac{z-a}{d} + 1$$

$$= \frac{58-2}{2} + 1$$

$$= \frac{56}{2} + 1$$

$$= 29$$

(±)

$$d = \frac{(z+a)(z-a)}{2s-(a+z)}$$

$$= \frac{(50+5)(50-5)}{880-(5+50)}$$

$$= \frac{2475}{825} = 3$$

$$n = \frac{2s}{a+z}$$

$$= \frac{880}{55}$$

$$= 16$$

(±)

$$d = \frac{(z+a)(z-a)}{2s-(a+z)}$$

$$= \frac{(80+5)(80-5)}{2210-(5+80)}$$

$$= \frac{85 \times 75}{2125}$$

$$= 3$$

$$n = \frac{2s}{a+z}$$

$$= \frac{2210}{85}$$

$$= 26$$

$$a = \frac{2s}{n} - z$$

$$= \frac{2 \times \frac{2}{7} 3542}{\frac{1}{4} z} - z$$

$$= \frac{2 \times 1012}{22} - 88$$

$$= \frac{1012}{11} - 88$$

$$= 92 - 88 = 4$$

(九)

$$d = \frac{2(nz-s)}{n(n-1)}$$

$$= \frac{2(32 \times 165 - 280)}{32 \times 31}$$

$$= \frac{528 - 280}{16 \times 31}$$

$$= \frac{248}{496} = \frac{1}{2}$$

(十)

$$a = \frac{2s}{n} - z$$

$$= \frac{2 \times 280}{32} - 165$$

$$= \frac{280}{16} - 165$$

$$= \frac{16}{16} = 1$$

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十一
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十三
十四
十五
十六
十七
十八
十九
二十
二十一
二十二
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三十一
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四十
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四十二
四十三
四十四
四十五
四十六
四十七
四十八
四十九
五十

$$s = \frac{n}{2}(a+l) \quad \text{㉔}$$

$$d = \frac{l-a}{n-1}$$

$$= \frac{46}{2}(275+5) \quad = \frac{5-275}{46-1}$$

$$= 23 \times 280 \quad = \frac{-270}{45}$$

$$= 6440, \quad = -6$$

$$l = a + (n-1)d \quad \text{㉕}$$

$$\frac{1}{2} = \frac{1}{3} + (5-1)d \quad (1) \quad d = \frac{\frac{1}{2} - \frac{1}{3}}{4} \quad (3)$$

$$\frac{1}{2} - \frac{1}{3} = 4d \quad (2) \quad = \frac{1}{24}, \quad (4)$$

$$s = \frac{365}{2}(2 + (365-1)2) \quad \text{㉖} \quad l = 1 + (365-1)2$$

$$= 365^2 \quad = 728+1$$

$$= 133225, \quad = 729,$$

$$3720 = \frac{60}{2}(3+3+(60-1)d) \quad \text{㉗}$$

$$d = \frac{(1000+1)(1000-1)}{10010 - (1+1000)} \quad \text{㉘} \quad n = \frac{10010}{1001}$$

$$= \frac{999999}{9009} \quad = 10,$$

$$= 111,$$

$$d = \frac{(57+1)(57-1)}{2 \times 841 - (57+1)} \quad \text{㉙} \quad n = \frac{2 \times 841}{57+1}$$

$$= \frac{58 \times 56}{1624} \quad = \frac{1682}{58}$$

$$= 2, \quad = 29,$$

$$d = \frac{(15+\frac{1}{3})(15-\frac{1}{3})}{2 \times 345 - (15+\frac{1}{3})} \quad \text{㉚} \quad n = \frac{2 \times 345}{15+\frac{1}{3}}$$

$$= \frac{44 \times 46 \times 9}{690 - 15\frac{1}{3}} \quad = \frac{690}{46\frac{1}{3}}$$

$$= \frac{2024 \times 9}{6072 \times 9} \quad = \frac{690 \times 3}{46}$$

$$= \frac{1}{3} \quad = 45,$$

斐波那契

卷二十一

三

中本齋

$$s = \frac{101}{2}(1+z)$$

$$= \frac{101}{2}(2 + (101-1)\frac{1}{2})$$

$$= \frac{101}{2}(2 + \frac{100}{2})$$

$$= \frac{101 \times 52}{2}$$

$$= 2626、$$

(一)

$$a = \frac{2(23 \times 117 - 1426)}{23 \times 22}$$

$$= \frac{2530}{506} = 5、$$

(二)

$$a = \frac{2(15 \times 24 - 2025)}{15 \times 14}$$

$$= \frac{1575}{105}$$

$$= 15、$$

(三)

$$a = \frac{2852}{23} - 117$$

$$= 7、$$

$$a = \frac{405}{15} - 24$$

$$= \frac{81}{3} - 24$$

$$= 3、$$

$$= 30 \times 6 + 59z \times 30$$

$$z = \frac{3720 - 30 \times 6}{30 \times 59}$$

$$= 2、$$

$$r = 3 + (60-1)z$$

$$= 3 + (59)2$$

$$= 3 + 118$$

$$= 121、$$

(四)

$$z = a + (8-1)5$$

$$z = 2 + 35$$

$$= 37、$$

$$156 = \frac{8}{2}(a + a + (8-1)5)$$

$$= 4(2a + 35)$$

$$= 8a + 140$$

$$= \frac{156 - 140}{8}$$

$$= 2、$$

(五)

$$r = 1 + (101-1)\frac{1}{2}$$

$$= 51、$$

$$a = \frac{5252-5151}{101}$$

$$= \frac{101}{101} = 1、$$

$$d = \frac{2(nz-s)}{n(n-1)}$$

$$= \frac{2(5151-2626)}{101(100)}$$

$$d = \frac{10302-5252}{10100}$$

$$= \frac{505}{1010}$$

$$= \frac{1}{2}、$$

(无)

$$n = \frac{d - 2a \pm \sqrt{(d - 2a)^2 + 8as}}{2d}$$

$$= \frac{2 - 2 \times 1 \pm \sqrt{(2 - 2 \times 1)^2 + 8 \times 2 \times 110}}{2 \times 2}$$

$$= \frac{-2 + \sqrt{4 + 16 \times 110}}{4}$$

$$= \frac{-2 + \sqrt{1764}}{4}$$

$$= \frac{40}{4}$$

$$= 10、$$

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$$d = \frac{(85+7)-5}{29}$$

$$= \frac{87}{29}$$

$$= 3、$$

$$d = \frac{93-3}{30}$$

$$= 3、$$

$$d = \frac{1855-15}{11}$$

$$= \frac{1705}{11}$$

$$= 155$$

$$a = \frac{2s-7n}{n}$$

$$43. 1. 1 = 2626$$

$$a = \frac{2 \times 2626 - 101 \times 51}{101}$$

$$s = \frac{30}{2}(5+92)$$

$$= 15(97)$$

$$= 1455、$$

(无)

$$s = \frac{31}{2}(3+93)$$

$$2s = 31 \times 96$$

$$s = 1488$$

(无)

$$s = \frac{12}{2}(15+1855)$$

$$= 6 \times 2005$$

$$= 1203$$

(无)

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$$x = \text{長ノ甲} \quad y = \text{長ノ乙} = x + 10$$

$$\frac{360}{x} = \frac{320}{x+10} + 4 \quad (1)$$

$$360x + 3600 = 320x +$$

$$4x^2 + 40x \quad (2)$$

$$4x^2 = 3600$$

$$x^2 = 900$$

$$x = 30, \quad y = 40$$

$$a = \text{人良} \quad b = \text{和ノ妻妻}$$

$$a^2 = x^2 + (b-x)^2$$

$$a^2 = x^2 + b^2 - 2bx + x^2$$

$$2x^2 - 2bx = a^2 - b^2$$

$$a^2 - bx + \frac{(a+b)(-a+b)}{2} = 0 \quad (4)$$

$$x = \frac{b}{2} \pm \sqrt{\frac{b^2 - 2(a+b)(b-a)}{4}}$$

(1) 分
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$$a = \text{妻} \quad b - a = \text{男}$$

(1) 問題ニ依リテ

(2) (1)ヲ改作ス

(3)

(3) 後部ヲ括
前部ノ段数ヲ
以テ除ニ定置
ヲ棄ス

$$7 = \frac{2s - an}{n} = \frac{220 - 20}{10} = \frac{20}{1} = 20$$

$$n = \frac{27 + a \pm \sqrt{(27 + a)^2 - 8as}}{2a}$$

$$= \frac{236 + 3 \pm \sqrt{(236 + 3)^2 - 8 \times 3 \times 2380}}{2 \times 3}$$

$$= \frac{239 \pm \sqrt{57121 - 57120}}{6} = \frac{240}{6} = 40$$

$$a = 7 - (n-1)d$$

$$= 118 - (39)3$$

$$= 118 - 117$$

$$= 1$$

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$$15x - 800 + 10x = 800$$

$$25x = 1600$$

$$x = 64$$

$$30 - 64 = -34$$

(五)

x = 数歩ノ及速

$$\frac{7x}{3} = 60 + \frac{9x}{6}$$

$$5x = 360$$

$$x = 72$$

$$14x = 360 + 9x$$

(六)

x = 場相銀 y = 價石一

$$\frac{8y}{x} = 6,25 + \frac{8,4}{x}$$

$$8y = 6,25x + 8,4$$

$$y = \frac{6,25x + 8,4}{8}$$

$$x + y = 100,8$$

$$x + \frac{6,25x + 8,4}{8} = 100,8$$

$$= \frac{1}{2} (b \pm \sqrt{b^2 - 2(a+b)(b-a)})$$

$$= \frac{1}{2} (21 \pm \sqrt{441 - 2 \times 36 \times 6})$$

$$= \frac{1}{2} (21 \pm \sqrt{441 - 432})$$

$$= \frac{1}{2} (21 \pm \sqrt{9})$$

$$= \frac{1}{2} \cdot 24$$

$$= 12$$

$$= 21 - 12 = 9$$

(三)

x = 数葉 $\frac{1}{4}x$ = 令一政太 $\frac{1}{5}x$ = 貨新

$$2x + \frac{1}{4}x + \frac{1}{5}x = 245 \quad (1)$$

$$40x + 5x + 4x = 4900$$

(二) 令数ノ每

$$49x = 4900$$

$$x = 100$$

(四)

x = 日働 $30 - x$ = 日怠

$$15x - 10(30 - x) = 300$$

$5 \times 8 + 5 = 45$ 、橋 $5 \times 5 + 2 = 27$ 、柑

(九)

$$x = \frac{2 \times 1800 - 25(24)2}{2 \times 25}$$

$$= \frac{3600 - 1200}{50}$$

$$= \frac{2400}{50} = 48$$
、

$$z = \frac{2 \times 1800 + 24 \times 25 \times 2}{50}$$

$$= \frac{3600 + 1200}{50} = \frac{4800}{50} = 96$$
、

(十)

$x =$ 数^フ追^{甲乙}里^及 = $\frac{5x}{3}$

$x + 8 =$ 数^ハ、^ハ = $\frac{7(8+x)}{5}$

$$3: x :: 5: \frac{5x}{3}$$

$$5: x + 8 :: 7: \frac{7(8+x)}{5}$$

$$\frac{5x}{3} = \frac{7(x+8)}{5} \quad (1)$$

里数

$$25x = 21x + 168$$

(1) 分数標

$8x + 6, 25x + 84 = 80, 64$

$14, 25x = 798$

$\therefore x = 56$ 、

(七)

$AB:AC :: AB:AD$

$AD = \frac{AC \times \frac{AC}{2}}{AB}$

$8AD = AC \times \frac{AC}{2}$

$2 \times 8AD = \sqrt{848} \sqrt{848}$

$= \sqrt{(848)^2}$

$= 848$

$AD = \frac{848}{16} = 53$

$BD = 53 - 8 = 45$ 、

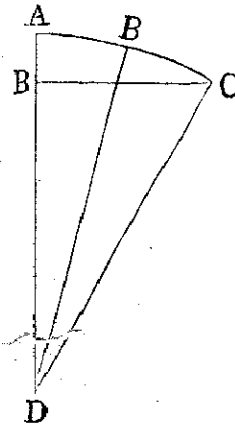
(八)

$x =$ 数人

$8x + 5 = 5x + 2 + 18$

$3x = 15$

$x = 5$ 、



算術

$$1 + \frac{b}{a} = 1 + \frac{d}{c} \quad (5) \quad \frac{b}{a} = \frac{d}{c} \quad (9)$$

$$\frac{a+b}{a} = \frac{c+d}{c} \quad (6) \quad 1 - \frac{b}{a} = 1 - \frac{d}{c} \quad (10)$$

$$\frac{a+b}{c+d} = \frac{a}{c} \quad (7) \quad \frac{a-b}{a} = \frac{c-d}{c} \quad (11)$$

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$$a+b:c+d::a:c \quad (8) \quad \frac{a-b}{c-d} = \frac{a}{c}$$

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(15)

a = 数惣

$$x - \left(\frac{x}{3} - 6\right) = \frac{2x}{3} - 6 = 清初$$

$$\frac{x}{3} + 6 = 絹$$

$$\frac{x}{3} - 3 + 10 = \frac{x}{3} + 7 = 紬$$

$$\frac{x}{3} + 6 + \frac{x}{3} + 7 + 2 = x$$

$$x + 15 + x + 21 + 6 = 3x$$

$$x = 45, \quad 15 + 6 = 21 \text{ 紬}$$

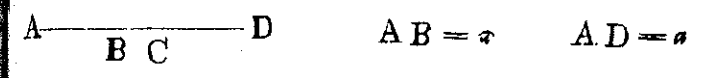
$$15 + 7 = 22 \text{ 絹} \quad 2 = \text{丈八}$$

$$4x = 168$$

$$x = 42, \text{ 甲時}$$

$$\frac{42 \times 5}{3} = 70, \text{ 七十里}$$

(16)



$$3x = 2CD \quad \frac{3x}{2} = CD$$

$$\frac{1}{4}x + \frac{8}{4}x = 3BC \quad BC = \frac{1}{3}x$$

$$x + \frac{x}{3} + \frac{3x}{2} = a$$

$$6x + 2x + 9x = 6a$$

$$17x = 6 \times 84$$

$$BC = 4, \quad CD = 18,$$

(17)

$$a:b::c:d \quad (1)$$

$$a:b::o:d \quad (3)$$

$$a \pm b:c \pm d::a:c \quad (2)$$

$$\frac{b}{a} = \frac{d}{o} \quad (4)$$

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$$15x - 3x = 24 \times 6 \times 5$$

$$12x = 720 \quad \therefore x = 60$$

(天)

$$x = \begin{matrix} \text{字} / \text{掌甲} \\ \text{文中} / \end{matrix} \quad y = \begin{matrix} \text{数} / \text{中掌乙} \\ \text{字} / \text{掌} / \end{matrix} \quad y = vx \text{ 入ト}$$

$$3x^2 + xy = 68 \quad (1) \quad 4y^2 + 3xy = 160 \quad (2)$$

$$3x^2 + x^2v = 68 \quad (3) \quad (一) \text{ } y \text{ 消去}$$

$$x^2 = \frac{68}{3+v} \quad (4)$$

$$4v^2x^2 + 3x^2v = 160 \quad (5) \quad (二) \text{ } y \text{ 消去}$$

$$x^2 = \frac{160}{4v^2+3v} \quad (6)$$

$$\frac{68}{3+v} = \frac{160}{4v^2+3v} \quad (七)$$

$$272v^2 + 204v = 480 + 160v \quad (8) \quad (七) \text{ } \text{全数} \text{ } \text{ヲ} \text{ 掃}$$

$$272v^2 + 44v = 480 \quad (9)$$

$$68v^2 + 11v = 120 \quad (10) \quad (九) \text{ } \text{即} \text{ } \text{消} \text{ } \times$$

$$4v^2 + \frac{11}{17}v = \frac{120}{17} \quad (11) \quad (十) \text{ } \text{十} \text{ } \text{消} \text{ } \times$$

(五)

$$x = \text{損缺} \quad 100 - x = \text{全}$$

$$3(100 - x) - 9x = 240$$

$$300 - 3x - 9x = 240$$

$$12x = 60 \quad \therefore x = 5$$

(六)

$$x = \text{高入歳}$$

$$x - 80000 = \begin{matrix} \text{年甲} \\ \text{貯毎} \end{matrix} \quad x - 100000 = \begin{matrix} \text{年乙} \\ \text{貯毎} \end{matrix}$$

$$5(x - 80000) = 7(x - 100000)$$

$$5x - 400000 = 7x - 700000$$

$$2x = 300000 \quad \therefore x = 150000$$

(七)

$$x = \text{貯} \quad \frac{x}{3} = \text{船} \quad \frac{1}{4}(x - \frac{x}{3}) = \frac{x}{6} \text{ 食盡}$$

$$\frac{1}{5}(x - (\frac{x}{3} + \frac{x}{6})) = \frac{6x - 3x}{5 \times 6} = \frac{x}{10} = \text{金落}$$

$$x - \frac{x}{3} - \frac{x}{6} - \frac{x}{10} = 24$$

$$6x - 2x - x - \frac{3x}{5} = 24 \times 6$$

$$3x - \frac{3x}{5} = 24 \times 6$$

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$$x^2 = \frac{68}{3 - \frac{24}{17}} = \frac{68}{\frac{51-24}{17}} \quad (25) \quad (4) \rightarrow (16) \text{ 換}$$

$$27x^2 = 68 \times 17$$

$$x^2 = \frac{68 \times 17}{27}$$

$$x = \pm \frac{34}{3\sqrt{3}} \quad (26)$$

$$\frac{3 \times 1156}{27} \pm \frac{34}{\sqrt{27}} y = 68 \quad (1) \rightarrow (26) \text{ 換}$$

$$\pm \frac{34}{\sqrt{27}} y = 68 - \frac{1156}{9}$$

$$= \frac{612 - 1156}{9}$$

$$= -\frac{544}{9}$$

$$- \frac{544}{9}$$

$$y = \pm \frac{34}{\sqrt{27}}$$

$$= -\frac{544}{9} \times \pm \frac{\sqrt{27}}{34}$$

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$$4v^2 + \frac{11}{17}v + \left(\frac{11}{68}\right)^2 = \frac{32761}{(68)^2}$$

$$2v + \frac{11}{68} = \pm \frac{131}{68} \quad (13)$$

$$2v = -\frac{11}{68} \pm \frac{131}{68} \quad (14)$$

$$= -\frac{142}{68}, \quad \frac{120}{68} \quad (15)$$

$$= -\frac{24}{17}, \quad \frac{5}{4} \quad (16)$$

$$x^2 = \frac{68}{3 + \frac{5}{4}} = \frac{68}{\frac{17}{4}} \quad (17) \quad (4) \rightarrow (16) \text{ 換}$$

$$= 68 \times \frac{4}{17} \quad (18)$$

$$17x^2 = 68 \times 4 \quad (19)$$

$$x^2 = 16 \quad (20)$$

$$x = \pm 4 \quad (21)$$

$$3 \times 16 + (\pm 4)y = 68 \quad (22) \quad (1) \rightarrow (4) \text{ 換}$$

$$\pm 4y = 68 - 48 \quad (23)$$

$$y = \pm 5 \quad (24)$$

(12) + 17 令 + 1
 = 14 分 + 17 乘
 其自乘 = 17 乘
 = 14

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$$\left(\frac{x-115}{50} + 39 - 16\right) + 68 = 101$$

$$x - 115 + (23 + 68)50 = 5050$$

$$x - 115 + 4550 = 5050$$

$$x = 615$$

(三)

$x =$ 叔 $2x =$ 仲 $6x =$ 伯

$$x + 2x + 6x = 270$$

$$x = 30, \quad 2x = 60, \quad 6x = 180$$

(三)

$x =$ 具農 $200 - x =$ 田

$$\frac{x}{2} = \frac{200 - x}{3}$$

$$3x = 400 - 2x$$

$$5x = 400 \quad \therefore x = 80 \text{具} \quad 120 \text{田}$$

(四)

$x =$ 施 $y =$ 遺

$$y = 3x$$

$$x \times \frac{1}{6} y = x + y$$

$$= \mp \frac{544\sqrt{27}}{306} \times \frac{\sqrt{27}}{\sqrt{27}}$$

$$= \mp \frac{544 \times 27}{306\sqrt{27}} = \mp \frac{48}{\sqrt{27}}$$

$$= \mp \frac{48}{3\sqrt{3}} = \mp \frac{16}{\sqrt{3}} = y$$

(九)

$x =$ 年 n 去過

$$20 - x = \frac{2x}{3}$$

$$60 - 3x = 2x$$

$$60 = 5x$$

$$x = 12$$

(十)

$x =$ 得所 n 日一子弟

$$\frac{100 - 10x}{16} = \frac{70 - 7x}{18}$$

$$1800 - 180x = 1264 - 112x$$

$$18x = 36 \quad \therefore x = 2$$

(十一)

$$\left(\frac{x-115}{50} + 39 - 16\right) + 68 = 101$$

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$$z = 12, \quad (1)-(7) \quad v = 6, \quad (4)-(7)$$

$$y = 10, \quad (2)-(7) \quad u = 4, \quad (5)-(7)$$

$$x = 8, \quad (3)-(7)$$

(五)

$$x = \text{甲} \quad y = \text{乙} \quad z = \text{丙}$$

$$x + \frac{1}{2}(y+z) = a \quad (1) \quad 51 = a \quad \text{スト}$$

$$y + \frac{1}{3}(x+z) = a \quad (2)$$

$$z + \frac{1}{4}(x+y) = a \quad (3)$$

$$x + (x+y+z) = 2a \quad (4) \quad (1) \text{ 7 変作ス}$$

$$2y + (x+y+z) = 3a \quad (5) \quad (2) \text{ 7}$$

$$3z + (x+y+z) = 4a \quad (6) \quad (3) \text{ 7}$$

$$(x+y+z) = s \quad (7)$$

$$6x + 6s = 12a \quad (8) \quad (4) \times 6$$

$$6y + 3s = 6a \quad (9) \quad (5) \times 3$$

$$6z + 2s = 8a \quad (10) \quad (6) \times 2$$

$$6s + 11s = 29a \quad s = 87 \quad (8) + (9) + (10)$$

$$x = 2a - s = 15, \quad (4) \text{ 1 変作}$$

$$xy = 6x + 6y$$

$$x = \frac{6x + 6y}{y} = \frac{2y + 6y}{y} = \frac{8y}{y}$$

$$x = 8, \quad y = 24$$

(五)

$$\frac{1}{2}x = y$$

$$100 - x = 3(48 - y)$$

$$100 - 2y = 144 - 3y$$

$$y = 44, \quad x = 88,$$

(六)

$$u + v + x + y + 2z = 52 \quad (1)$$

$$u + v + x + z + 2y = 50 \quad (2)$$

$$x + v + y + 2x = 48 \quad (3)$$

$$u + x + y + z + 2v = 46 \quad (4)$$

$$v + x + y + z + 2u = 44 \quad (5)$$

$$6u + 6v + 6x + 6y + 6z = 240 \quad (6)$$

$$u + v + x + y + z = 40 \quad (7)$$

$$y=7$$

$$((4) \times 7) - (3)$$

$$\therefore \frac{3}{7}$$

(III)

$$488 = \frac{n}{2} (20 + 20 + (n-1)8)$$

$$876 = 40n + 3n^2 - 8n$$
$$= 37n + 3n^2$$

$$292 = \frac{37}{3}n + n^2$$

$$n^2 + \frac{37}{3}n - 292 = 0$$

$$n = -\frac{37}{6} \pm \sqrt{\frac{37^2}{36} + 292}$$

$$= -\frac{37}{6} \pm \sqrt{\frac{11881}{36}}$$

$$= -\frac{37}{6} \pm \frac{109}{6} = 12$$

(IV)

$$x = \text{貯} / \text{初}$$

$$\frac{1}{4}(x-12) = x-57$$

$$2y = 3x - 8 \quad \therefore y = 33 \quad (5) \text{ 依} \rightarrow$$

$$3x = 1x - 8 \quad \therefore x = 39 \quad (6) \text{ 依} \rightarrow$$

(V)

$$x = \text{子分} \quad y = \text{母分}$$

$$\frac{x+1}{y} = \frac{1}{3} \quad (1)$$

$$\frac{x}{y+1} = \frac{1}{4} \quad (2)$$

$$3x - y = -3 \quad (3)$$

(1) 分數換位置

$$4x - y = 1 \quad (4)$$

(2) 分數換位置

$$x = 4 \quad (4) - (3)$$

$$y = 15 \quad ((3) \times 4) - ((4) \times 3)$$

$$\therefore \frac{4}{15}$$

(VI)

$$x = \text{子分} \quad y = \text{母分}$$

$$\frac{x+2}{y} = \frac{5}{7} \quad (1)$$

$$\frac{x}{y+2} = \frac{1}{3} \quad (2)$$

$$7x - 5y = -14 \quad (3) \quad (1) \rightarrow \text{改作}$$

$$3x - y = 2 \quad (4) \quad (2) \rightarrow \text{改作}$$

$$x = 3 \quad ((4) \times 5) - (3)$$

卅四

$x = \text{籍書}$ $341 - x = \text{價器測}$

$$2x - \frac{3}{8}(341 - x) = 3(341 - x) - \frac{5}{7}x$$

$$112x - 7161 + 21x = 57288 - 168x - 40x$$

$$341x = 64449 \quad \therefore x = 189$$

$$341 - x = 152$$

$$189 \times 5 = 945, \quad 152 \times 5 = 760,$$

卅五

$x = \text{問時力合}$

$$\frac{3}{5} + \frac{2}{3} + \frac{7}{11} = \frac{36}{x}$$

$$x(3 \times 3 \times 11 + 2 \times 5 \times 11 + 7 \times 5 \times 3) = 36 \times 5 \times 33$$

$$x = \frac{5940}{314} = 18^h 55^m 1^s \frac{143}{157}$$

卅六

$x = \text{贊元}$ $a = 1000 \text{ 金千一}$

$$x - a + \frac{x - a}{3} = \frac{4}{3}(x - a) = \text{贊初年二}$$

$$\frac{4x - 4a}{3} - a + \frac{1}{3}(\frac{4x - 4a}{3} - a)$$

$$x - 12 = 4x - 228$$

$$3x = 216 \quad \therefore x = 72,$$

卅七

$x = \text{貯}$ $\frac{x}{4} + 200 = \text{太}$ $\frac{x}{5} + 340 = \text{次}$

$$\frac{x}{6} + 300 = \text{三} \quad \frac{x}{8} + 400 = \text{四}$$

$$\frac{x}{4} + \frac{x}{5} + \frac{x}{6} + \frac{x}{8} + 1240 = x$$

$$89x + 1240 \times 120 = 120x$$

$$-31x = -1240 \times 120$$

$$x = 4800, \quad 1400 = \text{黍} \quad 1800 = \text{黍}$$

$$1100 = \text{三} \text{ 郎}$$

$$1000 = \text{四} \text{ 郎}$$

$$x = \text{米} \quad \frac{4}{5}x = \text{麥} \quad \frac{5}{4} \times \frac{4}{3}x = \frac{5}{3}x = \text{豆}$$

$$x + \frac{4}{3}x + \frac{5}{3}x = 720 \times 0.18$$

$$x + 3x = 720 \times 18$$

$$x = 32, 4,$$

$$\frac{4}{3}x = 43, 2,$$

$$\frac{5}{3}x = 54,$$

$$315x = 24 \times 315$$

$$x = 24 = D \quad 36 = C \quad 80 = B$$

$$175 = A$$

(死)

$x =$ 齡 / 年本

$$x + 25 + 5 = 6(x + 5)$$

$$x + 30 = 6x + 30$$

$$x = 0$$

(平)

長子継

$x =$ 財蓄 / 間周一

$$\frac{1}{3}(6 + 5x) + 2x = 21$$

$$6 + 5x + 6x = 63$$

$$11x = 57 \quad \therefore x = 5.1818$$

(四)

$x =$ 存貯初

$$x - \left(\frac{1}{2}x + \frac{1}{2}\right) - \left(\frac{1}{4}x + \frac{1}{4}\right) - \left(\frac{1}{8}x + \frac{1}{8}\right) - \left(\frac{1}{16}x + \frac{1}{16}\right) = 0$$

$$16x - 8x - 8 - 4x - 4 - 2x - 2 - x - 1 = 0$$

$$x = 15$$

$$\frac{4}{3} \left(\frac{4x - 4a}{3} - a \right) = \frac{16x - 16a}{9} - \frac{4x}{3} \quad \text{三初年賞}$$

$$\frac{4}{3} \left(\frac{16x - 16a}{9} - \frac{4a}{3} - a \right) = 2x$$

$$4^3x - 4^3a - 4^2 \times 3a - 4 \times 3^2a = 3^3 \times 2a$$

$$4^3x - 4a(4^2 + 3 \times 4 + 3^2) = 2 \times 3^3x$$

$$4^3x - 4a(16 + 12 + 9) = 54x$$

$$4a \times 37 = 10x$$

$$4 \times 37 \times 1000 = 10x$$

$$x = 14800$$

(世)

$$y = \pm 2 \pm 3 = \pm 5$$

$$y^2 = \frac{3}{1} = 3 \quad \therefore y = \pm \sqrt{3}$$

(世)

$$C = 1 - \frac{1}{2}D = \frac{3}{2}D \quad B = \frac{4}{3}(C + D) = \frac{4}{3} \times \frac{5}{2}D$$

$$A = \frac{5}{4}(B + C + D) = \frac{5 \times 5 \times 7}{2 \times 3 \times 4}D$$

$$\left(\frac{175}{234} + \frac{80}{234} + \frac{36}{234} + \frac{24}{234} \right) x = 315$$

$$3x + 4x = 120 \quad \therefore x = 17^m \quad 8\frac{4}{7}$$

$x = \text{位百}$ $y = \text{位十}$ $z = \text{位一}$

$$100x + 10y + z = 9 \quad (1) \quad z = 2x \quad (2)$$

$$100z + 10y + x = 100x + 10y + z + 198$$

$$99z = 99x + 198 \quad (3) \quad \text{中ヲ改作ス}$$

$$z = x + 2 \quad (4) \quad (3) \text{ヲ } z \text{ 九ニ代ス}$$

$$\frac{z}{2} = x \quad (5)$$

$$\frac{x+2}{2} = x \quad (6) \quad (5) \text{ (2) ヲ換フ}$$

$$x + 2 = 2x$$

$$x = 2, \quad z = 2 \times 2 = 4, \quad y = 3,$$

$x = \text{長}$ $y = \text{子小}$ $z = \text{妹}$

$$y = 2z + 10000 \quad (1) \quad z = 8y + 15000 \quad (2)$$

$$x + y + z = 955000 \quad (3)$$

$$3y + 15000 + y + z = 955000 \quad (4)$$

$x = \text{時今}$ $20 - x$ $x - 4$

$$\frac{1}{2}(x-4) + \frac{4}{5}(20-x) = x$$

$$5x - 20 + 240 - 12x = 15x$$

$$x = 10,$$

$$\frac{4}{3}x = \frac{x}{2} + 10$$

$$8x = 3x + 60 \quad \therefore x = 12,$$

$$x + 2x + 3x = 12 \quad 6x = 12 \quad x = 2,$$

$$2x = 4, \quad 3x = 6,$$

$x = \text{乙}$ $20 - x = \text{甲}$

$$x : 20 - x :: 2 : 3 \quad 3x = 40 - 2x$$

$$5x = 40 \quad \therefore x = 8 = \text{乙} \quad 20 - x = 12 \text{ 甲}$$

$x = \text{間時ル充水テ管兩}$

$$\frac{x}{40} + \frac{x}{30} = 1$$

ハ今ヨリ夜半迄
ハ日出ヨリ今迄

幾進夕所

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才靠位

$$12y + \frac{1}{2}y = 900 \quad (8) \quad \text{⑤、⑥倍=①、②加}$$

$$25y = 1800 \quad \text{⑧、⑨倍}$$

$$y = 72, \quad z = 84, \quad \text{⑩}$$

$$x \quad x+y \quad x+2y \quad x+3y \quad x+4y$$

$$x + x + y + x + 2y + x + 3y + x + 4y = 65$$

$$5x + 10y = 65$$

$$x + 2y = 13$$

$$x^2 + x + y^2 + x + 2y^2 + x + 3y^2 + x + 4y^2 = 1005$$

$$5x^2 + 20xy + 30y^2 = 1005$$

$$x^2 + 4xy + 6y^2 = 201$$

$$x + 2y^2 = 13^2 = x^2 + 4xy + 4y^2 = 169$$

$$2y^2 = 32 \quad y^2 = 16 \quad y = 4$$

$$x = 5, \quad x + y = 9, \quad x + 2y = 13,$$

$$x + 3y = 17, \quad x + 4y = 21,$$

$$4y + z = 640000 \quad (5) \quad \text{④、⑤倍}$$

$$4(2z + 10000) + z = 940000 \quad \text{⑥、⑦、⑧、⑨倍}$$

$$9z = 900000$$

$$z = 100000$$

$$45y = 945000 \quad \text{①、②、③、④、⑤、⑥、⑦、⑧、⑨倍}$$

$$45y = 9450000$$

$$y = 210000, \quad z = 645000,$$

⑩

$$x + \frac{1}{2}y = 100 \quad (1) \quad y + \frac{1}{3}z = 100 \quad (2)$$

$$z + \frac{1}{4}x = 100 \quad (3)$$

$$2x + \frac{1}{3}z = 100 \quad (4) \quad \text{①、②倍=③、④減}$$

$$6x + \frac{1}{4}z = 400 \quad (5) \quad \text{④、⑤倍=⑥、⑦加}$$

$$25x = 1600 \quad (6) \quad \text{⑤、⑥倍}$$

$$x = 64,$$

$$3y + \frac{1}{4}z = 200 \quad (7) \quad \text{②、③倍=④、⑤減}$$

卷之十
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数学小册

数学小册

四

数学小册

$$4y = 48 \quad y = 12、$$

$$x = \frac{y}{3} = \frac{12}{3} = 4、$$

$$x = \text{賞介権} \quad y = \text{賞三阿}$$

$$x + 14 = y - 14 \quad (1) \quad 2(x - 14) = y + 14 \quad (2)$$

$$x + 28 = y \quad x - 42 = 28$$

$$2x - 28 = y + 14 \quad x = 70、$$

$$3x - 14 = 2y$$

$$3 \times 70 = 2y + 14$$

$$210 - 14 = 2y$$

$$y = 98、$$

$$x = \text{数線直} \quad (要)$$

$$15x - 9 = 14x + 16$$

$$x = 25、 \quad 25 \times 15 - 9 = 366$$

$$25 \times 14 + 16 = 366$$

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数学小册

数学小册

四

数学小册

$$x = \text{数介糸分兩} \quad 200 - x = \text{数介糸分兩} \quad (五)$$

$$5x + 9(200 - x) = 1200$$

$$5x + 1800 - 9x = 1200$$

$$-4x = -600$$

$$x = 150、 \quad 200 - x = 50、$$

$$x = \text{時酒全}$$

$$\frac{x}{15} - \frac{x}{20} = 1$$

$$4x = 3x = 60 \quad \therefore x = 60^{\text{分}} = 1^{\text{時}} \quad (五)$$

$$x = \text{甲} \quad y = \text{乙}$$

$$x + y = 16 \quad (1) \quad \frac{1}{x} + \frac{1}{y} = 2 \left(\frac{1}{x} - \frac{1}{y} \right) \quad (2)$$

$$y + x = 2y - 2x$$

$$3x = y \quad x = \frac{y}{3}$$

$$\frac{y}{3} + y = 16$$

$$y + 3y = 48$$

邊長

$$z = \frac{2 \times 4853 - 2 \times 23}{23}$$

$$= \frac{9706 - 46}{23} = 420 = 11, 2,$$

(亮)

$$x = \text{邊基} \quad y = \text{邊斜} \quad x + y = 9 \quad (1)$$

$$7x + 9y = 73 \quad (2)$$

$$2x = 8$$

(1) - 九倍 = (2) 減

$$x = 4,$$

$$2y = 10$$

(2) = (1) 七倍 減

$$y = 5,$$

(卒)

$$x = \text{線 虫} \quad y = \text{邊基} \quad x + y = 119 \quad (1)$$

$$3x - 2y = 17 \quad (2)$$

$$5y = 340$$

(1) - 三倍 = (2) 減

$$y = 68,$$

$$5x = 255$$

(2) = (1) 三倍 加

$$x = 51,$$

$$7225 \quad (3)$$

四直角邊自乘、和

邊長

三

三

(亮)

$$x = \frac{222 + 2222 \pm \sqrt{(222 + 2222)^2 - 8 \times 222}}{2 \times 222}$$

$$222 \times 3333$$

$$= \frac{2444 \pm \sqrt{48400}}{444}$$

$$= \frac{2444 \pm 220}{444}$$

$$= \frac{2664}{444} = 6,$$

$$x = 1111 - (6 - 1)222$$

$$= 1111 - 1110 = 1,$$

(卒)

$$x = \frac{19 - 2 \times 2 \pm \sqrt{(19 - 2 \times 2)^2 + 8 \times 19 \times 4853}}{2 \times 19}$$

$$= \frac{15 \pm \sqrt{225 + 737656}}{38}$$

$$= \frac{15 \pm \sqrt{737881}}{38} = \frac{874}{38}$$

$$= 23,$$

算學大成 卷之四 四十一

$x = \text{數或}$ $y = x^{\frac{3}{2}}$ ルノキト

$$x^3 - x^{\frac{3}{2}} = 56$$

$$y^2 - y = 56$$

$$4y^2 - 4y + 1 = 225$$

$$2y - 1 = \pm 15$$

$$y = x^{\frac{3}{2}} = 8 \quad -7$$

$$x^{\frac{1}{2}} = 2 \quad \sqrt{-7}$$

$$x = 4 \quad \sqrt[3]{49}$$

$x = \text{金貨}$ $7 = 2x$ ノキト

$$x^2 - 7x - 8 = 0 \quad (1)$$

$$x^2 - 2ax = 2a + 1 \quad (2)$$

$$x^2 - 2ax + a^2 = a^2 + 2a + 1 \quad (3)$$

$$x - a = \pm(a + 1) \quad (4)$$

$$x = 2a + 1$$

$$x = 8$$

a^2 加 = 率兩ヲ

(1) (2) (3) (4) 算

a^2 ノキト

85、 ③ノキトニ照ス

$y = \text{齡年蕩於}$ $x = \text{齡年吉恪}$

$$x - y = 6 \quad (1) \quad x^2 - y^2 = 106 + 146 \quad (2)$$

$$x = y + 6 \quad \therefore x^2 = y^2 + 12y + 36 \quad (3)$$

$$(y + 6)^2 = y^2 = x^2 - 12y + 36 \quad (4)$$

$$y^2 - x^2 + 12x - 36 = 252 \quad \text{②ノキト}$$

$$x = \frac{288}{12} = 24$$

$$y^2 + 12y + 36 - y^2 = 252 \quad \text{②ノキト}$$

$$y = \frac{216}{12} = 18$$

$x = \text{數某}$ $x^2 = y$ ノキト

$$x^4 - 34x^2 = -225 \quad (1)$$

$$y^2 - 34y = -225 \quad (2) \quad \text{①ノキト}$$

$$y^2 - 34y + (17)^2 = 289 - 225 = 64$$

$$y - 17 = \pm 8$$

$$y = x^2 = 25 \quad 5$$

算學大成 卷之四 四十一

$$3\left(\frac{x}{5} + 2\right) - \frac{1}{2}\left(\frac{x}{5} + 2\right) = \frac{5}{2}\left(\frac{x}{5} + 2\right) =$$

$$\frac{5x}{10} + 5 = 20$$

$$5x + 50 = 200$$

$$x = 30$$

$$x = \text{祿}$$

$$x - \frac{2}{3}x = \frac{x}{3}$$

$$\frac{x}{3} - \frac{2}{3}\left(\frac{x}{3}\right) = \frac{x}{9} \quad \frac{x}{9} = 70 \quad \therefore x = 630$$

$$x = \text{樹基} \quad \sqrt{x+16} = y \text{ルメキト}$$

$$x+16 - 8\sqrt{x+16} = 10 \quad (1)$$

$$y^2 - 8y + \frac{9}{4} = \frac{49}{4} \quad (2) \quad (1) \sqrt{x+16} \rightarrow y \text{ルメキト}$$

$$y = \frac{8}{2} \pm \frac{7}{2}$$

$$\sqrt{x+16} = 5 \quad x+16 = 25 \quad \therefore x = 9$$

$$(x+5)6 = 25+5$$

$$6x + 30 = 30$$

$$6x = 0 \quad x = \frac{0}{6} = 0$$

此ノ見ナシ

$$x = \text{數茶錢四十}$$

$$y = \text{數茶錢八十}$$

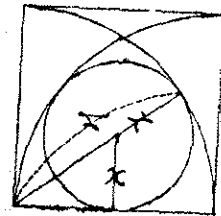
$$x+y=100 \quad (1) \quad 14x+18y=1680 \quad (2)$$

$$4x = 120$$

$$x = 30$$

$$4y = 280$$

$$y = 70$$



$$x = \text{徑半} \quad 2x = \text{徑直}$$

$$(4-x)^2 = 2^2 + x^2$$

$$16 - 8x + x^2 = 4 + x^2$$

$$12 = 8x \quad \therefore 2x = 3$$

$$x = \text{存原}$$

$$x - \frac{x}{5} + 4 = \frac{4x}{5} + 4 = 4\left(\frac{x}{5} + 1\right) \text{夕ノ日初}$$

$$4\left(\frac{x}{5} + 1\right) - \left(\frac{x}{5} + 1\right) + 3 = 3\left(\frac{x}{5} + 1\right) + 3$$

$$3\left(\frac{x}{5} + 2\right) \text{夕ノ日} =$$

$$16x + 4y = 624$$

(8) = 田ノ兼ノ

$$x = 24、$$

$$y = 60、$$

$$z = 120、$$

x = 数歩ノ及追 = 歩兵

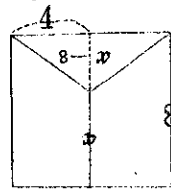
$$3:x::4:\frac{4x}{3}$$

$$4:x::5:\frac{5x}{4}$$

$$\frac{4x}{3} - 1165 = \frac{5x}{4}$$

$$16x - 13980 = 15x$$

$$x = 13980、$$



x = 長ノ邊斜

$$x^2 = (8-x)^2 + 16 \quad (1)$$

$$x^2 = 64 - 16x + x^2 + 16$$

(2) (1) 7 改作ノ

$$16x = 80$$

(2) 7 改作ノ

$$x = 5、$$

$$5 \times 15 = y + 10$$

(1) x = 数ノ配ノ

$$y = 65$$

即チ

$$16 \quad 1$$

金ノ長短ノ分

x = 数里時一人島 y = 隨

z = 宗戴

$$\frac{x}{2} + \frac{y}{3} + \frac{z}{4} = 62 \quad (1)$$

$$\frac{x}{3} + \frac{y}{4} + \frac{z}{5} = 47 \quad (2)$$

$$\frac{x}{4} + \frac{y}{5} + \frac{z}{6} = 38 \quad (3)$$

$$6x + 4y + 3z = 12 \times 62$$

(4) (1) 分数ヲ掃ノ

$$20x + 15y + 12z = 47 \times 60$$

(5) (2) 分数ヲ掃ノ

$$15x + 12y + 10z = 38 \times 60$$

(6) (3) 分数ヲ

$$24x + 16y + 12z = 2976$$

(7) (4) 約簡

$$4 + y = 156$$

(8) (7)-(5)

$$60x + 40y + 30z = 7440$$

(9) (4) 十倍

$$45x + 36y + 30z = 6840$$

(10) (6) 三倍

$$15x + 4y = 600$$

(9)-(10)

数学
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$$1:y::1:2$$

$$y=2$$

$$x+xy^2=300$$

$$x+4x=300$$

$$x=60, \quad xy=120, \quad xy^2=240$$

x = 日⁷及⁷追 = 数段

$$n(a+z) = \frac{x}{2}(a+z) \quad (1) \quad (1) \quad (2) \quad (3)$$

$$z = a + (n-1)d \quad (2) \quad \text{問題} = \text{依}$$

$$\therefore s = \frac{x(8+8+(x-1)-1)}{2} \quad (3) \quad \text{排}$$

$$14,4x = 42 + \frac{16x - x^2 + x}{2} \quad (4)$$

ル = 数四 = 14,4x
 追 四 日 代 7 進 里 追 七
 追 七 十 進 へ 惣 故 分 々 7
 衰 八 里 里 乙 s = ツ 十 n

除^レ後^ヲ x
 二^テ除^ク
 二^テ再^テ後^ヲ y
 二^テ除^ク

x = 質金 y = 質銀 $y = 100 - x$

$$\frac{13x}{195} + \frac{13y}{105} = 100 \quad (1)$$

$$105 \times 13x + 195 \times 13y =$$

$$100 \times 195 \times 105$$

$$8,5x + 6,5y = 100 \times 5 \times 10,5$$

$$8,5x + 6,5 \times 100 - 6,5x = 525$$

$$2x = 125$$

$$x = 41 \frac{2}{3}, \quad y = 58 \frac{1}{3}$$

$$\frac{x}{8} + \frac{x}{4} = 6$$

$$x + 2x = 48 \quad \therefore x = 16$$

x = 一第 xy = 二第 xy^2 = 三第

$$x^2y : x^2y^2 :: x : 2xy \quad (1)$$

$$1:y^2::1:2y \quad (2)$$

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$$\frac{4x^2}{49} - \frac{x}{2} + \frac{49}{64} = \frac{100}{64}$$

$$\frac{2x}{7} - \frac{7}{8} = \frac{10}{8}$$

$$\frac{2}{7}x = \frac{17}{8}$$

$$x = \frac{\frac{17}{8}}{\frac{2}{7}}$$

$$= \frac{119}{16} = 7 \frac{7}{8}$$

① 船の速さ

$$72x + 104x = 104x$$

$$92x - 35 = 72x + 35$$

$$x = 3 \frac{1}{2} \therefore 104x = 574$$

② 力速ノ間時一潮流

$$12 - x = 遊 \quad 12 + x = \text{下}$$

$$7(12 - x) = 5(12 + x)$$

$$x^2 = \left(\frac{1}{2} \times \frac{7}{4}\right)^2$$

$$= \left(\frac{7}{8}\right)^2$$

$$= \frac{49}{64}$$

③ 船の速さ

スト節後テヘ加ヲ里行

$$28.8x = 84 + 16x - x^2 + x$$

$$x^2 + 11.8x = 84$$

$$(x + 5.9)^2 = 84 + 34.81$$

$$x + 5.9 = \pm 10.9$$

$$x = -5.9 \pm 10.9$$

$$x = 5$$

④ 数共

$$25x^2 + 20x + 3 = 0$$

$$25x^2 + 20x + 4 = 1$$

$$5x + 2 = \pm 1$$

$$x = -\frac{3}{5}, \quad \frac{1}{5}$$

⑤ 高金 = 数札

$$\frac{4x^2}{49} - \frac{x}{2} - \frac{51}{64} = 0 \quad (1)$$

五日ニテ遊及ノ

①

$$x^2 = \left(\frac{20}{2 \times 5}\right)^2 = 2^2 = 4$$

② ノ根ヲ自乗スルナリ
③ ノ根ヲ自乗スルナリ
④ ノ根ヲ自乗スルナリ
⑤ ノ根ヲ自乗スルナリ

⑥ 船の速さ

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$x = \text{積家}$ $x - \frac{4}{5}x = \text{貯ノ年} - 2$ ②

$\frac{2}{5}x = \text{貯ノ年} - 2$ $\frac{2}{7}x = \text{債キハノ債ノ甲}$

$\frac{2}{5}x - \frac{2}{7}x = 32$ (1) 以同題ニ格ヲ換フ

$7x - 5x = 32 \times 16x$ (1)ニ分ス

$x = 280$ ③

$x = \text{金ル受ノ乙}$

$x + \frac{x}{10} = 482$

$11x = 4820$

$\therefore x = 420$ $\frac{x}{10} = 42$ ④

$x = \text{賀志}$ $y = \text{林小}$ $z = \text{治佐}$ $80 = \text{人主}$

$\frac{x+y+z}{2} = (3 \times 80) - 35$ (1)

$x + z + \frac{y}{8} = \frac{7}{2}(80) + 11$ (2)

$y + z + 80 = 2x - 11$ (3)

$84 - 7x = 60 + 5x$

$12x = 24$ $\therefore x = 2$ ⑤

$x = \text{貞人級一}$ $y = \text{貞人級二}$ $z = \text{貞人級三}$

$x = \text{貞人級四}$ $110 \text{兩} = x$

$x + \frac{y}{2} = x$ (1) $y + \frac{z}{3} = x$ (2) $z + \frac{y}{4} = x$ (3)

$x + \frac{z}{5} = x$ (4)

$2x - \frac{z}{8} = x$ (5)

$6x + \frac{y}{4} = x$ (6)

$24x - \frac{z}{5} = 15x$ (7)

$110x = 75x$

$x = 75$

$y = 88$

$z = 93$

$x = 104$

(1) 二倍ニ倍ス

(5) 二倍ニ倍ス

(6) 四倍ニ倍ス

(7) 十分數ヲ掃フ

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(1) 100ニ數ヲ配テ

(2) 120ニ數ヲ配テ

(3) 120ニ數ヲ配テ

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$$\frac{A+B}{A} = \frac{C+D}{C}$$

$$1 + \frac{B}{A} = 1 + \frac{D}{C}$$

$$\frac{A-B}{A} = \frac{C-D}{C}$$

$$\frac{A-B}{A+B} = \frac{C-D}{C+D}$$

$$A+B:A-B::C+D:C-D$$

(四)
x = 長 y = 廣 z = 高

$$xy = 105 \quad (1) \quad xy = 35 \quad (2) \quad xz = 21 \quad (3)$$

$$35z = 105$$

$$z = 3 \quad (4)$$

$$21y = 105$$

$$y = 5 \quad (5)$$

$$15x = 105$$

$$x = 7$$

(1) (2) (3) 配
高三間
(1) (2) (3) 配
廣五間
(1) (2) (4) (5) 配
長六間

(五)

$$2x - y - z = 91 \quad (4)$$

$$3x = 501$$

$$x = 167$$

$$8x + 8y + 8z = 3280 \quad (5)$$

$$8x + 8z + y = 2328 \quad (6)$$

$$7y = 952$$

$$y = 136$$

$$z = 107$$

x = 數題

$$x - \frac{x}{5} - 100 = \frac{x}{2} + 35$$

$$8x - 1000 = 5x + 350$$

$$3x = 1350 \quad \therefore x = 450$$

(六)
A:B::C:D \wedge A+B:A-B::C+D:C-D \wedge 上

$$A:B::C:D$$

$$1 + \frac{B}{A} = 1 + \frac{D}{C}$$

(3) 位置算
(4) 改作
九七ノ機

(1) 八倍

(2) 改作

(5)-(6)

(1) 依上

算學外師
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$$19000 = 25a + 25a + 25 \times 24 \times 30$$

$$19000 = 50a + 18000$$

$$a = \frac{1000}{50} = 20$$

(癸)

$$486 = 6r^4 \quad r = \text{合割}$$

$$r^4 = \frac{486}{6} = 81 \quad \sqrt[4]{81} = 3$$

$$3 \times 6 = 18 \quad \text{二解}$$

$$18 \times 3 = 54 \quad \text{三解}$$

$$54 \times 3 = 162 \quad \text{四解}$$

(乙)

$$x = \text{金} \quad y = 78 - x = \text{銀} \quad a = \text{量中水金}$$

$$b = \text{量中水銀} \quad a + b = 78 - 72 \quad (3)$$

$$195:1::x:a \quad (1) \quad 105:1::y:b \quad (2)$$

$$a = \frac{x}{195} \quad (1) \text{ 代入 } (3)$$

$$b = \frac{y}{105} \quad (2) \text{ 代入 } (3)$$

$$\frac{x}{195} + \frac{78-x}{105} = 6 \quad (4) \quad (3) \text{ 代入 } (4)$$

$$x = \text{數ノ負}$$

$$\sqrt{x} = 3 \quad -7$$

$$x + 4\sqrt{x} = 21$$

$$x = 9, \quad 49,$$

$$x + 4\sqrt{x} + 4 = 4 + 21$$

今夜 連夜

$$\sqrt{x} + 2 = \pm 5$$

(乙)

$$x = \text{甲} \quad 840 - x = \text{乙}$$

$$x - 840 + x = \frac{x}{3} \quad (1)$$

$$6x - 3 \times 840 = x \quad (1) \text{ 代入 } (1)$$

$$x = 3 \times 168 \quad \therefore 504, \quad 336,$$

(丙)

$$x = \text{費ノ住衣}$$

$$x + \frac{8x}{100} = 189 \quad (1)$$

$$108x = 18900 \quad (1) \text{ 代入 } (1)$$

$$x = 175,$$

(丁)

$$x = \frac{2}{2}(a+b) \quad b = a + (25-1)a$$

$$9500 = \frac{25}{2}a + \frac{25}{2}(a + (25-1)30)$$

$x =$ 教日、行旅ノ負朝

$$\frac{120}{10} = 12 = \text{教日、行東郎次曾阿}$$

$$\frac{120-s}{8} = \text{力速、帰西}$$

$$x = 12 + 8 - 2 + \frac{120-s}{8} \quad (1)$$

$$= 18 + \frac{120-s}{8}$$

$$8x = 144 + 120 - s$$

$$= 264 - s$$

$$x = \frac{2(s-an)}{n(n-1)}$$

$$x = -\frac{1}{4}$$

$$a = 5\frac{7}{8}$$

$$n = x$$

$$\frac{1}{4} = \frac{2(s - \frac{47}{8}x)}{x^2 - x} \quad (2)$$

以上問題ニ依テ

(1) 7 改作 8

(1) 7 改作 8

即チ

探術ノ式

九野ノ里ノ路
ノ一ノノ

初日ノ勢

$$105x + 78 \times 195 - 195x =$$

$$6 \times 195 \times 105$$

$$9x = 2925 \quad \therefore x = 325$$

$$y = 455$$

(4) 今勢ノ勢

(四)

$$x = 10 + \frac{1}{2}(x-10) + \frac{1}{4}x + 2$$

$$4x = 40 + 2x - 20 + x + 8$$

$$x = 28$$

價銀ノ什ノ銀

(五)

$$(x-y) \text{ 百位 } x \text{ 十位 } (x+y) \text{ 位}$$

$$\frac{100(x-y) + 10x + x + y}{3x} = 26 \quad (1)$$

$$100(x-y) + 10x + x + y + 198 =$$

$$100(x+y) + 10x + x - y \quad (2)$$

$$y = 1$$

(1) = 依テ

$$3x = 97$$

(2) = 依テ

$$x = 3 \quad \therefore 234$$

銀數三百三十日

(百)

$x =$ 教里、追田島リヨ京西

$x' =$ 教里、リヨ京東

妻
世
夕
阿

三

三

本
痛
虎

120-72=48

長京ヨリノ距離

$w = \text{距離ノ邊乙リヨ甲}$ $\frac{3}{2}w = \text{距離ノ邊丁リヨ丙}$

$34 - (\frac{3}{2}w + v) = 34 - \frac{5}{2}w = \text{距離ノ邊丙リヨ乙}$

$\frac{1}{4}w + \frac{1}{2} \times \frac{3}{2}w = 3(34 - \frac{5}{2}w)$

$\frac{1}{4}w + \frac{3}{4}w = 102 - \frac{15}{2}w$

$w = 102 - \frac{15}{2}w$

$2w = 204 - 15w$

$2w + 15w = 204$

$17w = 204$

$w = 12, \therefore \frac{3}{2}w = 18,$

$34 - \frac{5}{2}w = 4,$

直

$w = \text{甲} \quad 204 - w = \text{乙}$

$204 - w - \frac{2w}{5} = 4w - \frac{3(204 - w)}{7}$

$204 \times 35 - 35w - 14w = 140w - 15(204 - w)$

$-\frac{1}{4}w^2 + \frac{1}{4}w = 2s - \frac{47}{4}w \quad (3) \quad (2) \text{ヲ改作ス}$

$w^2 - w = 47w - 8s \quad (8) \text{ヲ四ノ倍ス}$

$w^2 - 48w + 8s = 0$

$w = 24 \pm \sqrt{576 - 8s} \quad (4)$

$24 \pm \sqrt{576 - 8s} = 33 - \frac{s}{8} \quad (4) \text{ノ右ヲ代}$

$\sqrt{576 - 8s} = 9 - \frac{s}{8} \quad \text{即チ}$

$8\sqrt{576 - 8s} = 72 - s \quad (5)$

$64(576 - 8s) = 5184 - 144s + s^2 \quad (5) \text{ヲ自乗ス}$

$36864 - 512s = 5184 - 144s + s^2$

$s^2 + 368s - 31680 = 0$

$s = -184 \pm \sqrt{33856 + 31680}$

$= -184 \pm 256$

$s = 72,$

西京ヨリノ距離

$8w = 264 - 72$

$w = 33 - 9 \quad \therefore w = 24,$

朝良旅行ノ日

$$\frac{6x}{100} \times 10 = \frac{60x}{100} \text{ 利}$$

問題 = 依下扱又

$$x - 12 = \text{利}$$

$$\frac{60x}{100} = x - 12 \quad (1)$$

$$60x = 100x - 1200$$

(1) / 分数ヲ解テ

$$40x = 1200$$

$$x = 30、$$

(夏)

$$x = \text{銀元}$$

$$1530 - x = \text{利月年个五十}$$

$$1488 - x = \text{利月年个八}$$

$$\frac{1488 - x}{8} = \frac{1530 - x}{15}$$

$$22320 - 15x = 12240 - 8x$$

$$7x = 10080 \quad \therefore x = 1440$$

(夏)

$$x = \text{高田古} \quad y = \text{高田新}$$

$$\frac{.72x}{y} = \frac{.5x}{x} \quad (1)$$

新田
古田
割合トト

$$-15x - 35x - 14x - 140x = 1740 - 3060$$

$$204x = 10200$$

$$x = 50、 \quad 204 - x = 154、$$

(夏)

$$x = \text{数冊ノ甲} \quad x + 16 = \text{数冊ノ乙} \quad \frac{1}{4} = \text{錢五廿}$$

$$\frac{24}{x} = \frac{24}{x+16} + \frac{1}{4}$$

$$24x + 16 \times 24 = 24x + \frac{x^2 + 16x}{4}$$

$$\frac{x^2}{4} + 4x = 384$$

$$\frac{x^2}{4} + 4x + 16 = 400$$

$$\frac{x}{2} = -4 \pm 20 \quad \therefore 32、 \quad 48、$$

(夏)

$$x = \text{量キ重リヨ水}$$

$$39 - 36 : 39 :: 1 : x$$

$$3x = 39 \quad \therefore x = 13$$

水 = 銀廿一十三粒

(夏)

$$x = \text{銀元}$$

支學子下

幾何學二條
 b 相乘積
 a b 相乘積

$$\frac{a}{2} = \frac{b}{y}$$

$$y = \frac{a}{2} \quad AD = CD = \frac{b}{2}$$

$$a : 2 :: \frac{a}{2} : x$$

$$\therefore x = 1$$

(見)

$$\frac{60 \text{ 圓}}{60 \text{ 月}} = 1 \text{ 返月每}$$

$$\frac{60(60+1)}{2} \times 1 : 60 \times 9 :: x : 15$$

$$60 \times 9x = \frac{60(60+1)}{2} \times 15$$

$$x = \frac{(60+1)5}{6}$$

$$= \frac{330}{6}$$

$$= 55 \quad 50$$

五兩五分

(算)

$$x + y = 12 \quad (1) \quad xy = 50 \quad (2) \quad y = 12 - x \quad (3)$$

$$x(12 - x) = 50 \quad (4)$$

(2) 1 y 3 代

$$y = rx$$

$$\frac{72x}{rx} = \frac{5rx}{x} \quad (2)$$

(1) 1 y 7 r^2 代

$$72 = 50r^2 \quad (3)$$

(2) 1 分數 7 掃 7 7
 百倍又

$$r^2 = \frac{72}{50} \quad (4)$$

$$\frac{36}{25} = \frac{6}{5} \quad (5)$$

(4) 7 平方 = 開 7

$$x + 25 = \frac{6}{5}x \quad (6)$$

問題 = 7 7 7 掃 7

$$x = \frac{25}{\frac{6}{5} - 1} = \frac{25}{\frac{1}{5}} = 125 \quad (7)$$

古高百二十五石

$$y = 150$$

新高百五十石

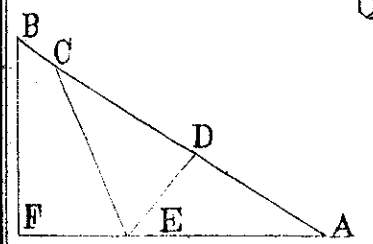
$$125 \times 75 = 90$$

古取米九十石

$$150 \times 5 = 75$$

新取米七十五石

(算)



$$DE = y$$

$$BF = x$$

$$AC = AF = b$$

幾何學二條

数学小市

$$44y = 88$$

$$y = 2$$

百三

$$n(n-1)(n-2)(n-3)(n-4) = 120 \left(\frac{(n-1)(n-2)n}{3 \cdot 2 \cdot 1} \right)$$

$$n^2 - 7n = 8$$

$$n = 8$$

百四

$$x = \text{西} \quad 3x = \text{東} \quad x + 3x = \text{中}$$

$$8x = 7200 \quad \therefore x = 900$$

$$2700 = \text{東} \quad 3600 = \text{中}$$

百五

$$x = \text{金利/甲} \quad y = \text{金利/乙}$$

$$8x + 3y = 25 \quad (1)$$

$$5x - 6y = 55 \quad (2)$$

$$21x = 105$$

$$x = 5$$

(1) \times 11 減 (2) \times 7 加

(1) \times 6 減 (2) \times 11 加

11 西

$$x^2 - 12x = -50 \quad (5)$$

(4) \times 操作

$$x^2 - 12x + 36 = -14$$

(5) \times 左自乗 \times 両邊 + 加

$$x - 6 = \pm \sqrt{-14}$$

$$x = 6 \pm \sqrt{-14}$$

$$x^2 + 2xy + y^2 = 144 \quad (6)$$

(1) \times 自乗

$$x^2 - 2xy + y^2 = -56$$

(2) \times 4倍 (6) \times 減

$$x - y = \pm \sqrt{-56}$$

$$= \pm 2\sqrt{-14} \quad (7)$$

$$2y = 12 \mp 2\sqrt{-14}$$

(3) \times (7) \times 減

$$y = 6 \mp \sqrt{-14}$$

ト 虚之 以 ル \times 負 根 平 幅 長
ス 題 \times テ \times 得 数 = 方 \times \times

$$x = \text{教町/礫/治平喜}$$

百一

$$y = \text{教町/礫/ト \times \times}$$

$$5x + 2y = 19 \quad (1)$$

$$7x - 6y = 9 \quad (2)$$

$$22x = 66$$

(1) \times 11 減 (2) \times 7 加

$$x = 3$$

11 西

数学小市

百一

數學

$$2n^2 + 5n = 102$$

$$2n = -\frac{5}{2} \pm \frac{29}{2} \quad n = 6、$$

百六

$$\frac{10x+y}{5} = 2x + \frac{1}{5} \quad \frac{10x+y}{8} = 5y + \frac{1}{8}$$

$$\frac{10x+y}{5} - \frac{1}{5} = 2x$$

$$10x + y - 1 = 10x$$

$$y = 1$$

$$\frac{10x+1}{8} = 5 + \frac{1}{8} \quad y \text{ 代入 } x$$

$$10x = 40 \quad \therefore x = 4、$$

百九

$$3x + y = 359 = a \quad (1) \quad 4y + z = a \quad (2)$$

$$5z + u = a \quad (3) \quad 6u + x = a \quad (4)$$

$$12x - z = 3a \quad (5) \quad (1) \sim (4) \text{ 代入 } m = 2 \text{ 乘}$$

$$60x + u = 16a \quad (6) \quad (5) \sim (6) \text{ 代入 } m = 3 \text{ 乘}$$

百六
百九
百七

$$63y = -315$$

$$y = -5、$$

(1) 代入 m = 2 乘

(2) 代入 m = 3 乘

百六

$$x = \text{小} \quad y = \text{大}$$

$$x^3 : y^3 :: 3 : 1 \quad (1) \quad 3y^3 = x^3 \quad y^3 = \frac{x^3}{3}$$

$$y^3 : x^2 :: 96 : 1 \quad (2) \quad 96x^2 = y^3 \quad y = \frac{x^{\frac{2}{3}}}{3^{\frac{1}{3}}}$$

$$x^{\frac{9}{2}} = 3^{\frac{5}{2}} \times 96x^2$$

$$x^{\frac{5}{2}} = 3^{\frac{5}{2}} \times 96$$

$$x^5 = 3^5 \times 32^2$$

$$= \sqrt[5]{248832}$$

$$x = 12、 \quad y = 24、$$

百七

n = 數日

$$\frac{n}{2}(6 + (n-1)2) = \text{數里甲} \quad \frac{n}{2}(8 + (n-1)2) = \text{數里乙}$$

$$\frac{n}{2}(6 + (n-1)2) = \frac{n}{2}(8 + (n-1)2)$$

百六
百九
百七

数学小

$$49x - 80x = 36 \quad z = \frac{40}{7}$$

$$49x^2 - 80x + \frac{1600}{49} = \frac{3364}{49}$$

$$7x - \frac{40}{7} = \pm \frac{58}{7}$$

$$x = 2$$

百三

$$19x = \text{離距地西}$$

$$x = \text{力速ノ日一乙}$$

$$x^2 = \text{離距ノ乙}$$

$$x = \text{数日ノ行旅乙}$$

$$7x + 32 = \text{離距ノ甲}$$

$$x^2 + 7x + 32 = 10x$$

$$x^2 - 12x = -32$$

$$x = 6 \pm 2$$

$$\therefore 19x = 76$$

百三

$$x \quad \sqrt{xy} \quad y \text{ 記三}$$

法率

$$x + \sqrt{xy} + y = 26 = a$$

$$x^2 + xy + y^2 = 364 = b$$

$$x + y = a - \sqrt{xy}$$

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$$359x = 95a$$

(3) 六拾ヨリ(4) 減

$$x = 95, \quad y = 74,$$

$$z = 63, \quad u = 44$$

$$x = \text{数某}$$

百十

$$25x^2 - 6 + \frac{1}{4x^2} = \frac{5}{4}$$

(1) 問ニ據テ接

$$25x^2 - 5 + \frac{1}{4x^2} = \frac{9}{4}$$

(2) (1)ノ解ヲ二テ加

$$5x - \frac{1}{2x} = \pm \frac{3}{2}$$

(3) (2)ヲ平方ニ開

$$10x^2 - 1 = \pm 3x$$

(4) (3)ノ各数ヲ掃

$$10x^2 \mp 3x = 1$$

(4) 位置ヲ変

$$100x^2 \mp 30x + \frac{9}{4} = 10 + \frac{9}{4} \quad (5)$$

$$10x \mp \frac{3}{2} = \pm \frac{7}{2}$$

$$10x = 5 \quad -2 \quad 2 \quad -5$$

$$x = \pm \frac{1}{2}, \quad \mp \frac{1}{5}$$

百一

$$\frac{7x^3 - 8x}{12} + \frac{7x^2 + 8x}{2} = 10x + 3$$

数学小

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反

$$2x^2 - 36 = 18x + 36 \quad (1) \quad \text{問題ニ依テ解ク}$$

$$x^2 - 9x = 36$$

$$x = 12,$$

百五

$$x = \text{數'初'續連} \quad x(x+1)(x+2) = \text{數續連}$$

$$(x+1)(x+2) + x(x+2) + x(x+1) = 74$$

$$3x^2 + 6x + 2 = 74$$

$$3x^2 + 6x = 72$$

$$x^2 + 2x = 24$$

$$x+1 = \pm 5 \quad \therefore x = \pm 5 - 1$$

$$x = 4 \quad - 6$$

$$4 \quad 5 \quad 6 = 120,$$

$$-6 \quad -5 \quad -4 = -120,$$

百六

$$x = \text{曙} \quad y = \text{報日} \quad z = \text{野朝}$$

$$x + 8 - 4 = y + z - 8 \quad (1)$$

(1) 位置ノ數ニ依テ
解ク

連續ノ積百十

或ハ負數百十

$$(x+y)^2 = a^2 - 2a\sqrt{xy} = b$$

$$-2a\sqrt{xy} = b - a^2$$

$$\sqrt{xy} = \frac{b - a^2}{-2a} = \frac{a^2 - b}{2a}$$

$$xy = \left(\frac{a^2 - b}{2a}\right)^2 = \left(\frac{312}{52}\right)^2 = 36$$

$$36 = 6 \times 6 = 2 \times 18$$

$$26^2 = 676 - 364$$

$$\frac{312}{52} = 6$$

$$x + y = 26 - 6 = 20$$

$$2, 6, 18,$$

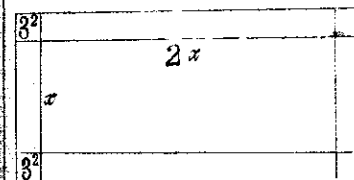
百七

$$x = \text{幅'版銅}$$

$$2x = \text{長'版銅}$$

$$2x^2 = \text{積'版銅}$$

$$18x + 4 \times 3^2 = \text{積'縁}$$



$$18x = (2x + 2x + x + x) \times 3$$

夏

2x = 離距ノ府二 18+x = 離距ノ甲

x-18 = 離距ノ乙

$\frac{4(x-18)}{63} = \text{割日一甲}$ $\frac{x+18}{28} = \text{割日一乙}$

$\frac{63(x+18)}{4(x-18)} = \frac{28(x-18)}{x+18}$ (1)

$9(x+18)^2 = 16(x-18)^2$ (2) (1) 両方を乗ず

$3(x+18) = 4(x-18)$ (2) 両方を3乗

$3x+54 = 4x-72$

$x=126 \quad \therefore 2x=252$

夏

$(x-y)(x^2-y^2) = 32$ (1) $(x+y)(x^2+y^2) = 272$ (2)

$x^3+x^2y+xy^2+y^3 = 272$ (3) (2) 7 改行

$x^3-x^2y-xy^2+y^3 = 32$ (4) (1) 7 改行

$2x^2y+2xy^2 = 240$ (5) (3) 7 (4) 7 減

$3x^2y+3xy^2 = 860$ (6) (5) 7 (4) 7 減

$\frac{1}{2}(y+8) = x+z-8$ (2)

$\frac{1}{3}(z+8) = x+y-8$ (3)

$x-y-z = -12$ (4)

$-2x+y-2z = -24$ (5)

$-3x-3y+z = -32$ (6) (4)+(6)

$-2x-4y = -44$

$x+2y = 22$ (8)

$-4x+3y = 0$ (9) (5)-(4) x 2

$11y = 88$ (8) x 4 + (9)

$z = 10, \quad y = 8, \quad x = 6$

夏

$n = 8 \quad r = \frac{n}{2} = 4 \quad r-r+1 = 5$

$s = \frac{8 \cdot 7 \cdot 6 \cdot 5}{4 \cdot 3 \cdot 2 \cdot 1} = 70$

$\frac{85}{70} = 5$

五十歳

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算

$x = \text{數位十}$ $y = \text{數位一}$

$$\frac{10x+y}{xy} = 2 \quad (1) \quad 10x+y+27=10y+x \quad (2)$$

$$9x-9y=-27$$

$$x-y=3 \quad x=y-3$$

$$2y^2-17y=-30$$

$$y=6 \quad x=3 \quad \therefore 36$$

算

$x = \text{男三}$ $y = \text{男二}$ $z = \text{男長}$

$$x-y=y-z-6$$

$$x-2y+z=-6 \quad (1) \quad x+y+z=33 \quad (2)$$

$$x^2+y^2+z^2=441 \quad (3)$$

$$3y=39 \quad (1)-(2)$$

$$y=13$$

$$x+z=20 \quad (4) \quad \text{二、對稱式}$$

$$2x^3+2y^3=304 \quad (7) \quad (3)+(4)$$

$$x^2+y^2=152 \quad (8) \quad \in \pi \parallel \in \pi$$

$$x^3+3x^2y+3xy^2+y^3=512 \quad (9) \quad (6)+(8)$$

$$(x+y)^3=512$$

$$x+y=8$$

$$y=8-x$$

$$3x^2y+3xy^2=360 \quad (9)-(8)$$

$$3xy(x+y)=360$$

$$3xy \times 8 = 360$$

$$24xy=360$$

$$xy=15$$

$$x(8-x)=15$$

$$x^2-8x=-15$$

$$x^2-8x+4^2=1$$

$$x-4=\pm 1$$

$$x=5, 8$$

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$$\frac{12}{x} + \frac{12}{x+10} = 1$$

$$24x + 120 = x^2 + 10x$$

$$x^2 - 14x = 120$$

$$x - 7 = \pm\sqrt{169}$$

$$x = 7 \pm 13 \quad \therefore x = \text{人或} = 20 \quad \text{人他} = 30$$

算
五

$$x = \text{贖元ノ甲} \quad 1000 - x = \text{贖元ノ乙}$$

$$1140 - x = \text{金利ノ甲}$$

$$640 - (1000 - x) = x - 360 = \text{金利ノ乙}$$

$$x : 1000 - x :: \frac{1140 - x}{9} : \frac{360}{6}$$

$$\frac{(x - 360)x}{6} = \frac{(1140 - x)(1000 - x)}{9}$$

$$x^2 + 3200x = 2280000$$

$$x + 1600 = \pm 2200$$

$$x = 600 = \text{甲} \quad 400 = \text{乙}$$

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$$x^2 + 2xz + z^2 = 400 \quad (5) \quad \text{(4)ノ結果}$$

$$2xz = 128 \quad (6) \quad \text{(3)ノyニ代入}$$

$$x^2 - 2xz + z^2 = 144 \quad (7) \quad \text{(6)ノ(5)ニ代入}$$

$$x - z = \pm 12 \quad (8) \quad \text{開ク}$$

$$x = 4$$

$$z = 16$$

$$\text{(4) + (8) = 結果}$$

$$x = 4, \quad y = 13, \quad z = 16$$

算
五

$$x = \text{長} \quad y = \text{幅}$$

$$xy = 24 \quad (1)$$

$$x^2 + y^2 + x + y = 62 \quad (2)$$

$$x^2 + 2xy + y^2 + x + y = 110 \quad \text{(1)ノ(2)ニ代入}$$

$$x + y = 10$$

$$x - y = 2 \quad x = 6, \quad y = 4$$

算
五

$$x = \text{数日ノ人ノ或} \quad x + 10 = \text{数日ノ人ノ他}$$

$$x \left(\frac{49}{a-x} \right) = (a-x) \frac{36}{x}$$

$$\frac{49x}{a-x} = \frac{36a-36x}{x}$$

$$49x^2 = 36a^2 - 72ax + 36x^2$$

$$49x^2 = 36(a-x)^2$$

$$x = 600$$

$$y = 7, \quad z = 6,$$

百
廿

$$x^2 + y^2 + x + y = 32 \quad (1)$$

$$x^2 + z^2 + x + z = 42 \quad (2)$$

$$y^2 + z^2 + y + z = 50 \quad (3)$$

$$x^2 - y^2 + z - y = 10$$

$$2x^2 + 2z = 60$$

$$x^2 + z = 30 \quad \therefore z = 5 \quad -6$$

$$y = 4 \quad -5$$

$$x = 3 \quad -4$$

$$2x^2 = \text{數買一第}$$

$$4 + 4x = \text{數買二第}$$

$$6x^2 + 12x + 12 = \text{數買三第}$$

$$8x^2 + 6x + 16 = \text{數買四第}$$

$$11x^2 + 22x + 32 = 1121$$

$$x^2 + 2x = 99$$

$$x + 1 = 100$$

$$x = -1 \pm 10 = 9$$

$$2x^2 = 162$$

$$\therefore 162 \text{ 一第 } 40 \text{ 二第 } 606 \text{ 三第 } 313 \text{ 四第}$$

百
廿
七

$$x = \text{借/甲} \quad a - x = \text{借/乙} \quad a = 1300$$

$$y = \text{合割/甲} \quad z = \text{合割/乙}$$

$$xy = (a-x)x$$

$$xz = 36$$

$$(a-x)y = 49$$

$$y = \frac{49}{a-x} \quad z = \frac{36}{x}$$

$$x + y = xy \quad (1)$$

$$x^2 + y^2 = xy \quad (2)$$

$$x^2 + 2xy + y^2 = x^2y^2 \quad (3)$$

$$xy = 3 \quad (4)$$

$$x^2 - 2xy + y^2 = x^2y^2 - 12 \quad (5)$$

$$= 9 - 12 = -3$$

$$(x-y)^2 = \sqrt{-3}$$

$$x-y = \pm\sqrt{-3} \quad (6)$$

$$x = \frac{1}{2}(3 \pm \sqrt{-3}) \quad y = \frac{1}{2}(3 \mp \sqrt{-3})$$

百四

$$x + y = xy \quad (1) \quad x^2 - y^2 = xy \quad (2)$$

$$x - y = 1 \quad (3)$$

$$x^2y^2 - 4xy = 1 \quad (1)^2 - (3)^2$$

$$x^2y^2 - 4xy + 2^2 = 5$$

$$xy - 2 = \pm\sqrt{5}$$

$$\frac{x^2 - y^2 = x + y}{x + y} = x - y = 1$$

解ノ(3)

百九

$$x = 0 \text{ 間ノ乙}$$

$$36 + 6x = (x-6)x$$

$$x^2 - 12x = 36$$

$$x - 6 = \sqrt{72}$$

$$x = +6 \pm \sqrt{72}$$

$$= 6 \pm 6\sqrt{2}$$

$$= 6(1 \pm \sqrt{2})$$

百

$$x = \text{邊ノ體立} \quad x^3 = \text{積}$$

$$\sqrt{3x^2} = \text{線斜}$$

$$x^3 = \sqrt{3x^2} \quad (1)$$

$$x^6 = 3x^2 \quad (2)$$

$$x^4 = 3$$

$$x = \sqrt[4]{3}$$

百三

問題ニ依テ接ス

(1)ヲ改作ス

(2)ヲ x^2 ニテ接ス

女界十市
三
寸
反

$$2(1 \pm \sqrt{5})y = 5 \pm \sqrt{5}$$

$$x = vy = \frac{1}{2}(1 \pm \sqrt{5}) \frac{1}{2} \sqrt{5}$$

$$y = \pm \frac{1}{2} \sqrt{5}$$

$$x = \frac{1}{4}(5 \pm \sqrt{5})$$

百四

$$x = \pm 2, y = \pm 3$$

$$y = 3, -2 \frac{1}{2}$$

$$x = 18, 12 \frac{1}{2}$$

百

$$x = 28, 12$$

$$y = 6, -13 \frac{1}{3}$$

$$y = -72, -8$$

$$x = 8, -17 \frac{2}{3}$$

百五

百六

$$y = \pm 6, x = \pm 15$$

$$x = 3, -4$$

百六

百七

$$y = \pm 5, x = \pm 9$$

$$y = 10, 45$$

百七

卷之十
百一
百二
百三
百四
百五
百六
百七

$$xy = 2 \pm \sqrt{5} \quad (4)$$

$$x + y = 2 \pm \sqrt{5} \quad (5)$$

(5) × (4) × (4)

$$x = \frac{1}{2}(3 \pm \sqrt{5})$$

(3) + (5) / 加減 / 半 //

$$y = \frac{1}{2}(1 \pm \sqrt{5})$$

↑ x y / 数 / 得

百三

$$x^2 - y^2 = xy \quad (1)$$

$$x^3 - y^3 = x^2 + y^2 \quad (2)$$

$$v^2 y^2 - y^2 = v y^2 \quad (3)$$

(1) / x / y = 代 /

$$v^3 y^3 - y^3 = v^2 y^2 + y^2 \quad (4)$$

(2) / x / y = 代 /

$$v^2 - 1 = v \quad (5)$$

(3) / y^2 = / 除 /

$$(v^2 - 1)y = v^2 + 1 \quad (6)$$

(4) / y^2 = / 除 /

$$2v = 1 \pm \sqrt{5} \quad (7)$$

(5) = 根 //

$$v^3 - v = v^2 \quad (8)$$

(5) = v / 乘 /

$$v^2 = v + 1 \quad (9)$$

(5) / 位置 / 変 /

$$v^3 - v = v + 1$$

(8) + (9) = 根 //

$$2vy = v^2 + 1 = v + 2$$

$$4vy = 2v + 4$$

數學外師卷之下終

頁五 $y = \pm 1 \pm \frac{1}{\sqrt{6}}$ $x = \pm 2, y = \pm 4$

頁六 $x = \pm 4, \pm 3\sqrt{3}$ $y = \pm 5, \pm \sqrt{3}$ $x = \pm \sqrt{\frac{5}{2}}, y = 2 \mp \sqrt{\frac{5}{2}}$

頁七 $y = 4, 1, -3 \pm \sqrt{5}$ $x = \pm 14, \pm 4\sqrt{2}$
 $x = 6, 9, -9 \mp \sqrt{5}$ $y = \pm 3\sqrt{2}, \pm 10$

頁八 $y = \pm 1, \pm \frac{8}{\sqrt{7}}$ $x = \pm 4, \pm \frac{34}{3\sqrt{3}}$
 $x = \pm 2, \mp \frac{3}{\sqrt{7}}$ $y = \pm 5, \mp \frac{16}{\sqrt{3}}$

頁九 $x = 3, -2$ $y = 2, -3$ $x = \pm 3, \pm \frac{8}{\sqrt{6}}$

明治八年十月二十三日版權免許
 同 年十二月二十一日 刻成

東京第二區三小區芝露月町二十三番地

中村 愿 輯 錄 并 藏

發行書林

東京小石川大門町二十一番地
 同 神田通新屋町二十番地
 青山 清 吉 店