

和算の奥義百選 ver.2
付録 和算家番付表

二代目 福田理軒

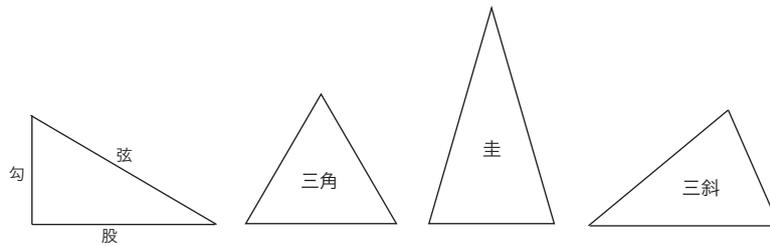
【凡例】

(1) 円内の文字は直径を表す.

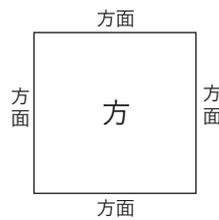
(2) 三角形の名称

(i) 勾股弦は直角三角形を表す. 勾は直角を挟む短い方の辺, 股は長い方の辺, 弦は斜辺を示す.
 $勾^2 + 股^2 = 弦^2$ を〈勾股弦の術〉という.

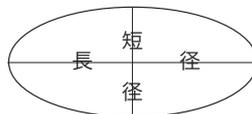
(ii) 正三角形は〈三角〉, 二等辺三角形は〈圭〉という. 一般の不等辺三角形は〈三斜〉という.



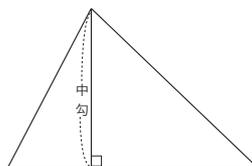
(3) 〈方〉は正方形, 〈方面〉は正方形の一边を表す.



(4) 楕円で〈長〉は長径, 〈短〉は短径を表す.

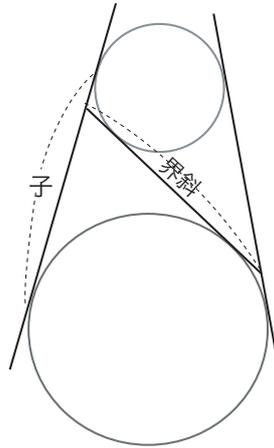


(5) 三角形の頂点から対辺に下ろした垂線を〈中勾〉という.

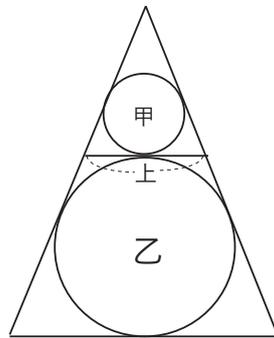


(6) 他は図形より付度すべし.

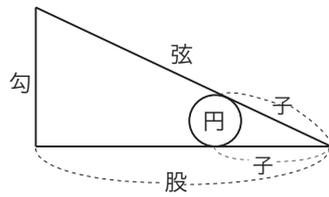
1 子 = 界斜



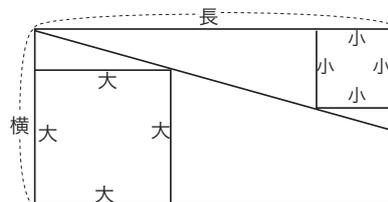
2 上² = 甲 · 乙



3 子 = $\frac{\text{円}(\text{股} + \text{弦})}{2 \text{勾}}$



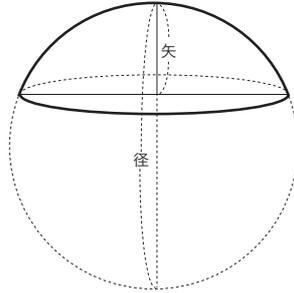
4 横 · 長 = 横 · 小 + 長 · 大



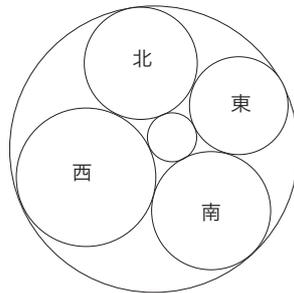
5 球闕の体積と表面積 (径は直径)

$$\text{体積} = \frac{\pi}{6}(3\text{径} - 2\text{矢})\text{矢}^2$$

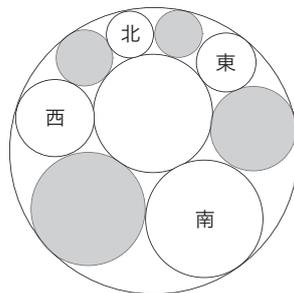
$$\text{表面積} = \text{矢} \cdot \text{径} \cdot \pi$$



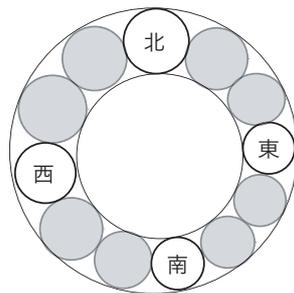
6 $\frac{1}{\text{東}} + \frac{1}{\text{西}} = \frac{1}{\text{南}} + \frac{1}{\text{北}}$



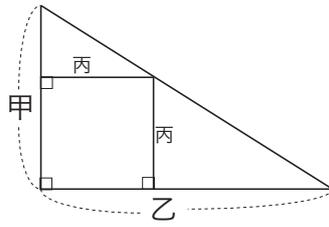
7 $\frac{1}{\text{東}} + \frac{1}{\text{西}} = \frac{1}{\text{南}} + \frac{1}{\text{北}}$



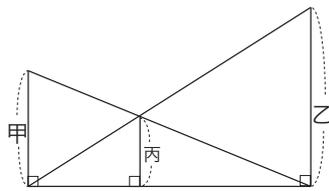
8 $\frac{1}{\text{東}} + \frac{1}{\text{西}} = \frac{1}{\text{南}} + \frac{1}{\text{北}}$



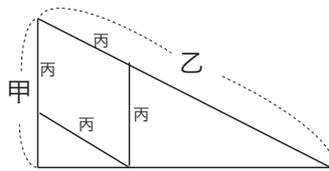
$$\boxed{9} \quad \frac{1}{\text{甲}} + \frac{1}{\text{乙}} = \frac{1}{\text{丙}}$$



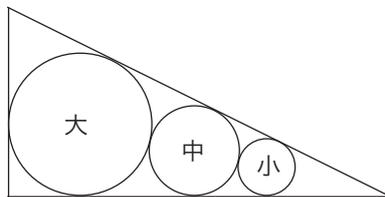
$$\boxed{10} \quad \frac{1}{\text{甲}} + \frac{1}{\text{乙}} = \frac{1}{\text{丙}}$$



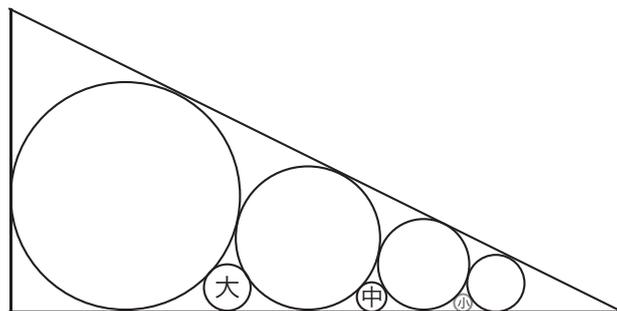
$$\boxed{11} \quad \frac{1}{\text{甲}} + \frac{1}{\text{乙}} = \frac{1}{\text{丙}}$$



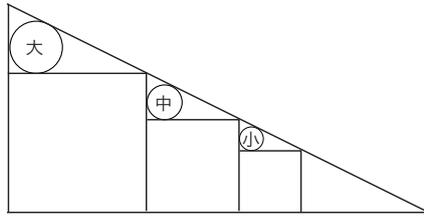
$$\boxed{12} \quad \text{中}^2 = \text{大小}$$



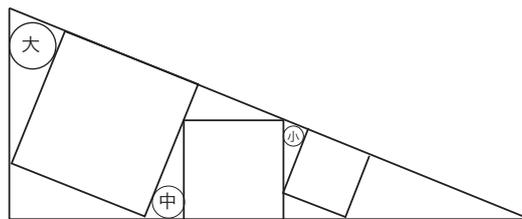
$$\boxed{13} \quad \text{中}^2 = \text{大小}$$



14 $中^2 = 大小$

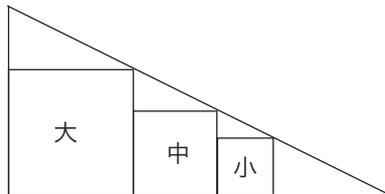


15 $中^2 = 大小$

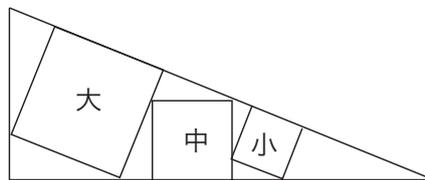


16 17 で正方形内の文字はその正方形の一辺の長さを表す。

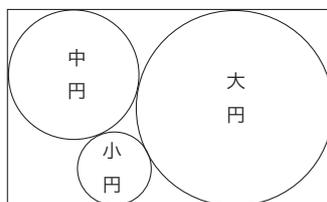
16 $中^2 = 大小$



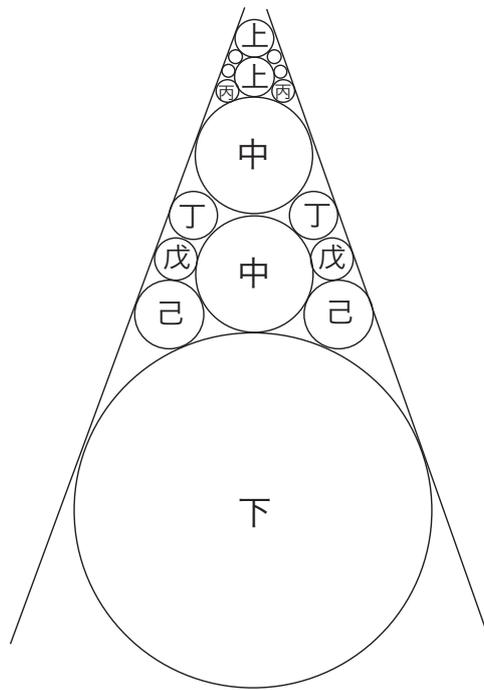
17 $中^2 = 大小$



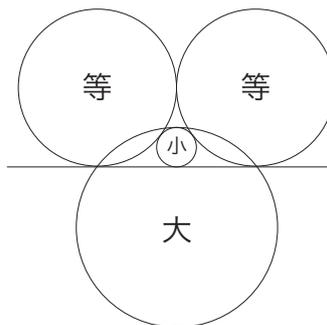
18 $大^2 = 4 中小$



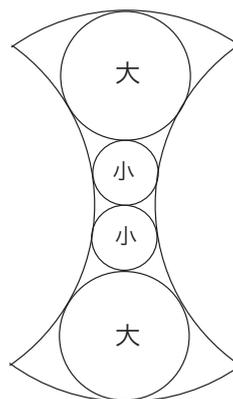
19 中² = 上下



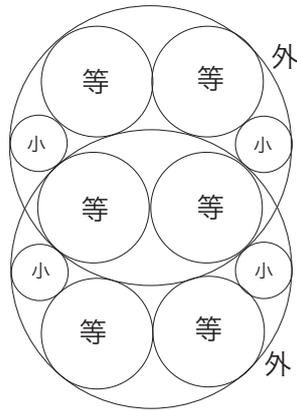
20 等 = 4 小



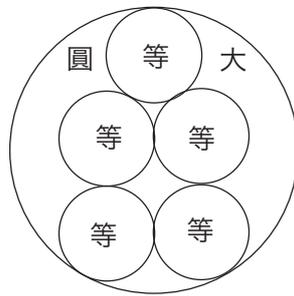
21 大 = 2 小



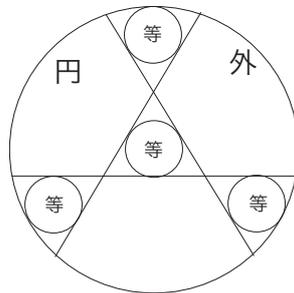
22 等 = $\frac{2}{5}$ 外



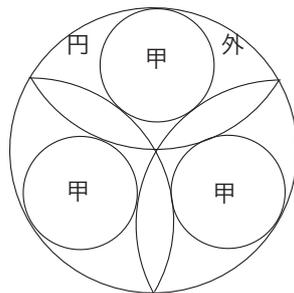
23 等 = $\frac{1}{3}$ 大



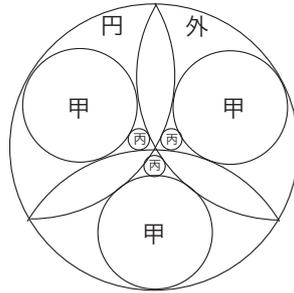
24 等 = $\frac{1}{5}$ 外



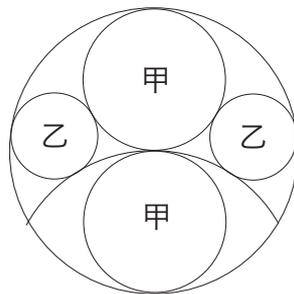
25 甲 = $\frac{2}{5}$ 外



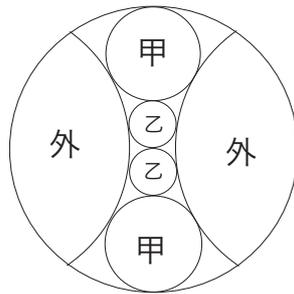
26 $\text{丙} = \frac{6}{85} \text{外}$



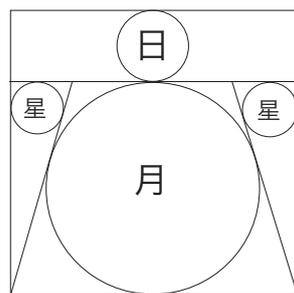
27 $\text{乙} = \frac{3}{5} \text{甲}$



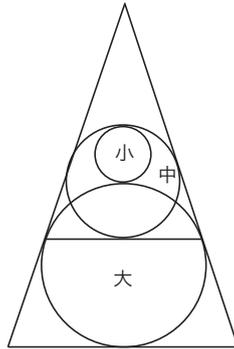
28 $\text{乙} = \frac{1}{6} \text{外}$



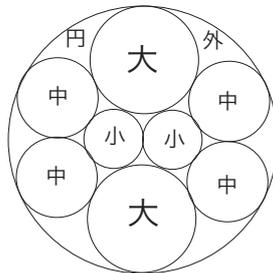
29 $\frac{1}{\text{月}} + \frac{1}{\text{日}} = \frac{1}{\text{星}}$



30 中 = 2 小

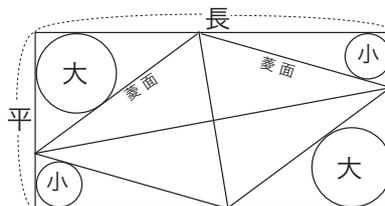


31 外 = 大 + 2 中

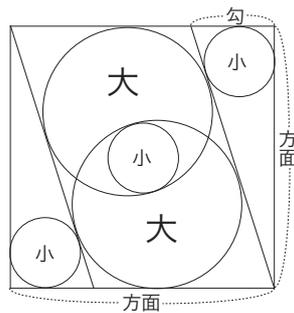


32 菱面 = $\frac{(\text{長} + \text{平}) - (\text{大} + \text{小})}{2}$

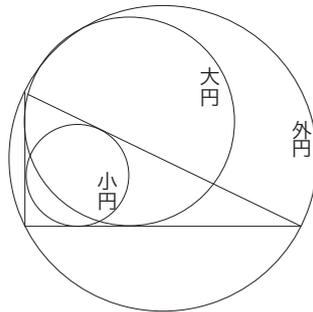
長方形に菱形を入れる。菱面は菱形の一辺



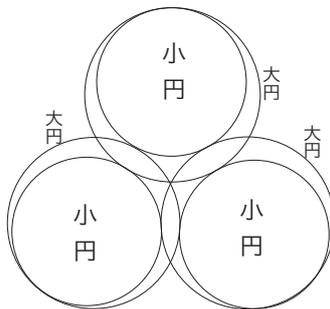
33 勾 = $\frac{1}{2}$ 大



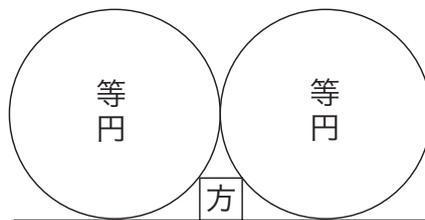
34 大 = 2 小 (外円内の直角三角形に小円が内接し, 大円は外円と直角三角形の2辺に接している.)



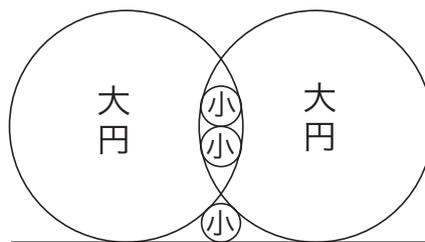
35 小 = $\frac{6}{7}$ 大



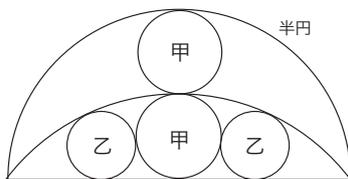
36 方面 = $\frac{1}{5}$ 等



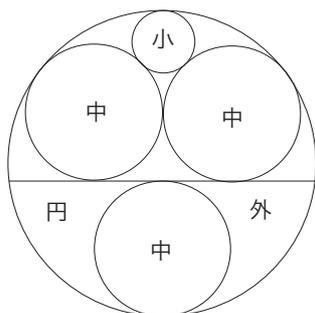
37 小 = $\frac{1}{6}$ 大



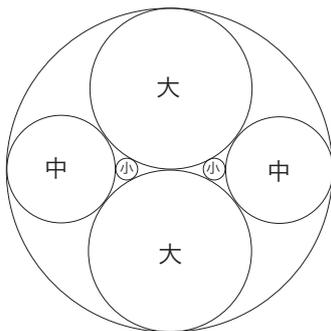
38 甲 = $\frac{5}{4}$ 乙



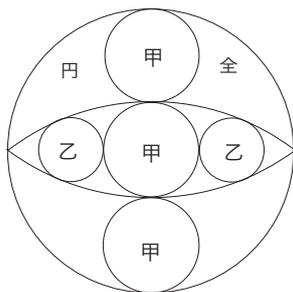
39 中 = $\frac{20}{9}$ 小



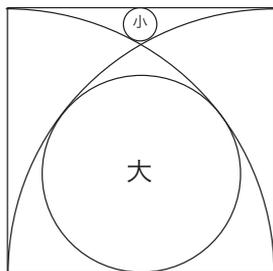
40 大 = $\frac{15}{2}$ 小



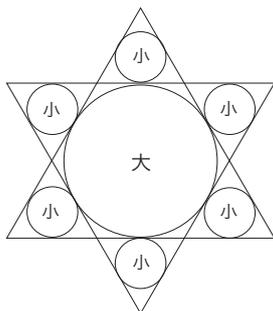
41 全 = $\frac{9}{2}$ 乙



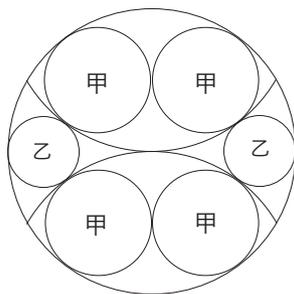
42 大 = 6 小



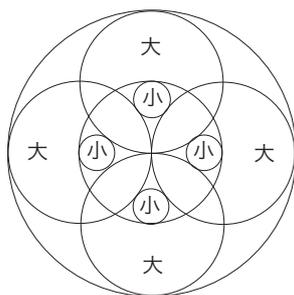
43 大 = 3 小



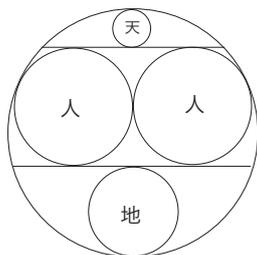
44 甲 = $\frac{3}{2}$ 乙



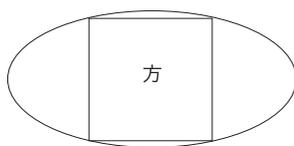
45 大 = 4 小



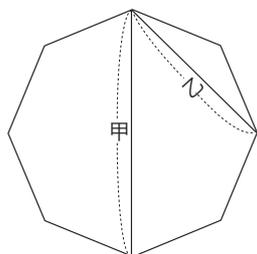
46 人 = $2\sqrt{\text{天} \cdot \text{地}}$



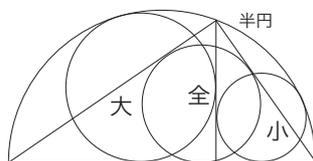
47 方面 = $\frac{\text{長} \cdot \text{短}}{\sqrt{\text{長}^2 + \text{短}^2}}$



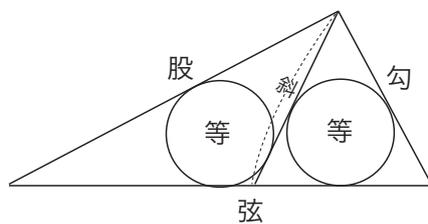
48 正八角形の面積 = 甲 × 乙



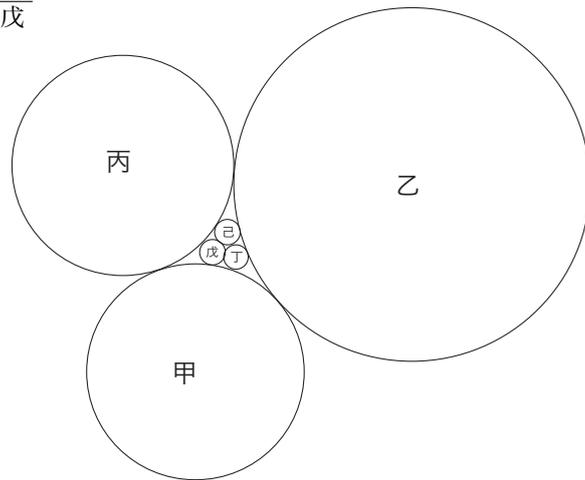
49 全 = $\frac{\text{大} + \text{小}}{2}$



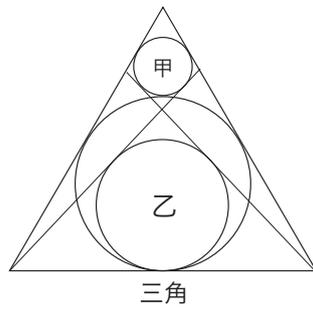
50 斜 = $\sqrt{\frac{\text{勾} \cdot \text{股}}{2}}$



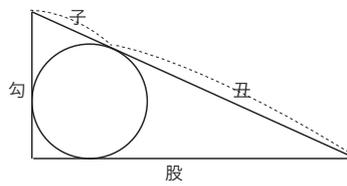
$$\boxed{51} \quad \frac{1}{\text{丙}} + \frac{1}{\text{丁}} = \frac{1}{\text{乙}} + \frac{1}{\text{戊}}$$



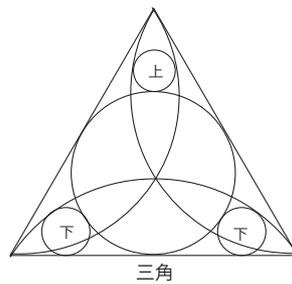
$$\boxed{52} \quad \text{甲} = \frac{4}{9} \text{乙}$$



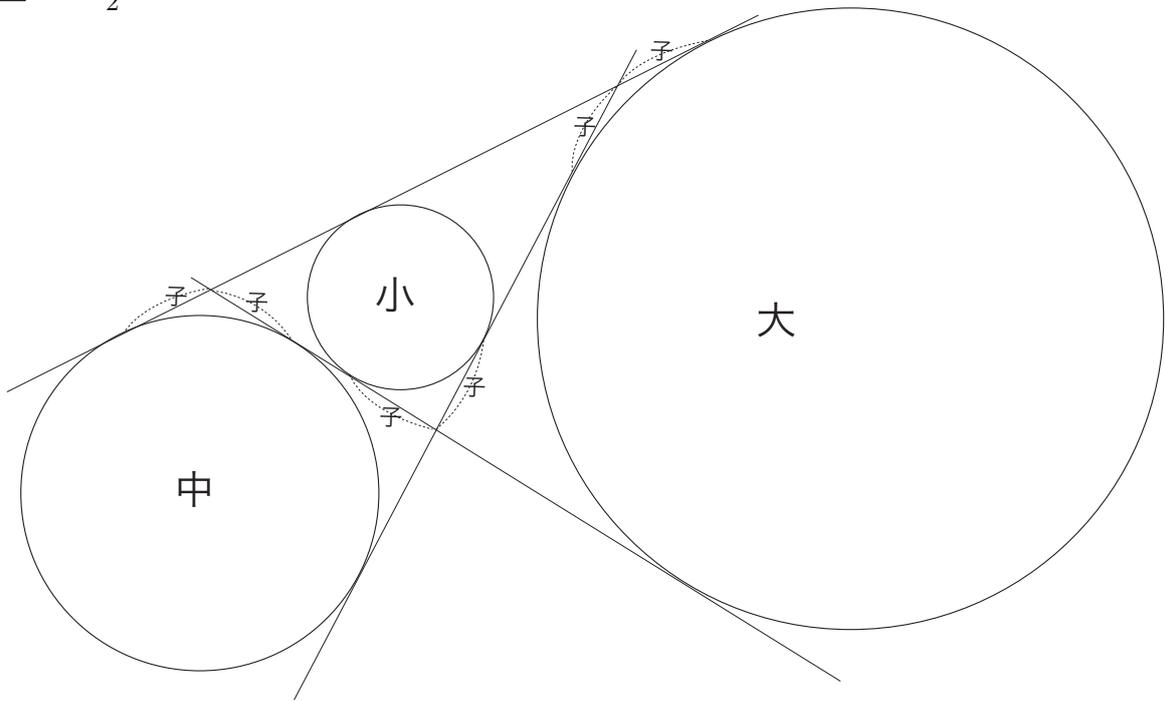
$$\boxed{53} \quad \text{直角三角形の面積} = \text{子} \times \text{丑}$$



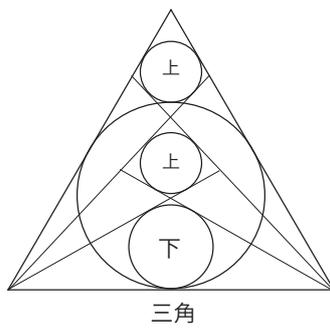
$$\boxed{54} \quad \text{下} = \frac{6}{5} \text{上}$$



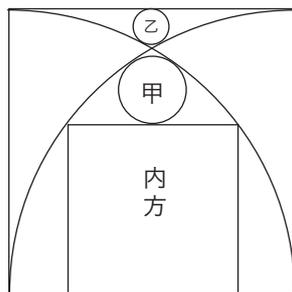
55 子 = $\frac{1}{2}\sqrt{\text{大中} - \text{中小} - \text{小大}}$



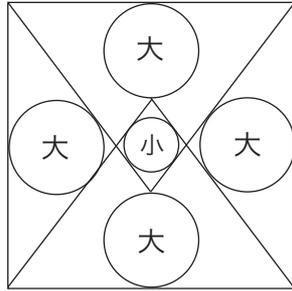
56 下 = $\frac{15}{11}$ 上



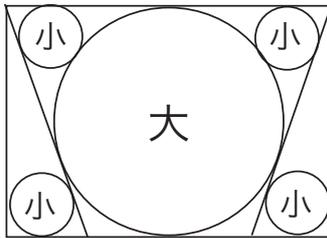
57 乙 = $\frac{20}{39}$ 甲



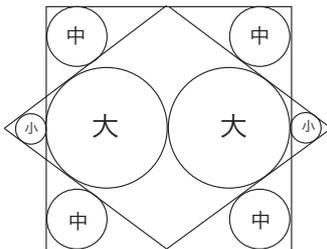
58 小 = $\frac{3}{5}$ 大



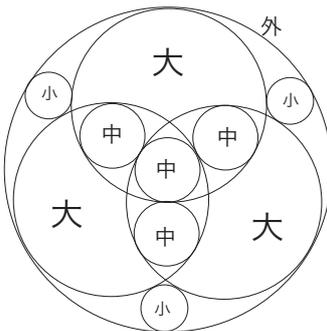
59 小 = $\frac{1}{4}$ 大



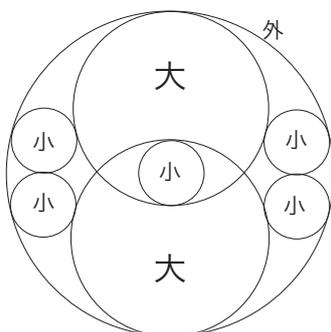
60 小 = $\frac{1}{2}$ 中



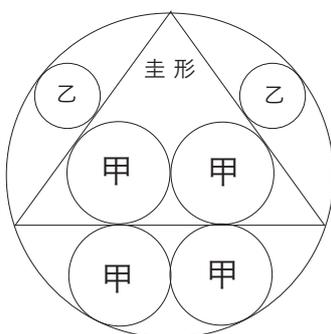
61 小 = $\frac{1}{7}$ 外



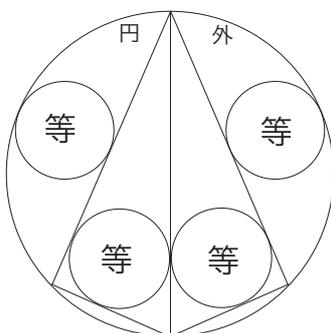
62 小 = $\frac{1}{5}$ 外



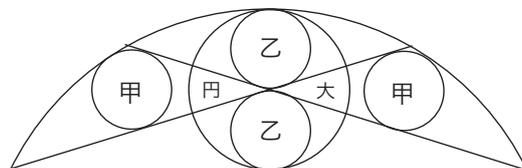
63 乙 = $\frac{5}{8}$ 甲



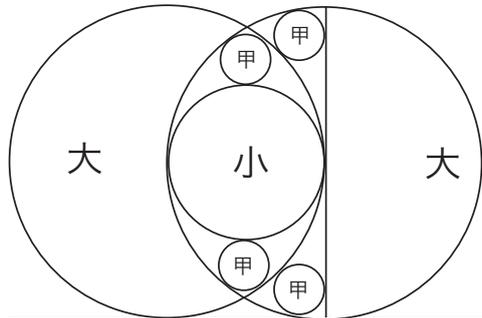
64 等 = $\frac{4}{13}$ 外



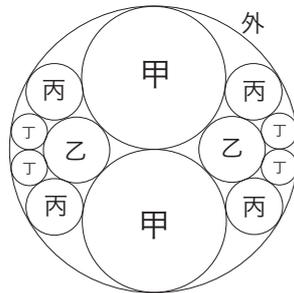
65 甲 = $\frac{1}{2}$ 大



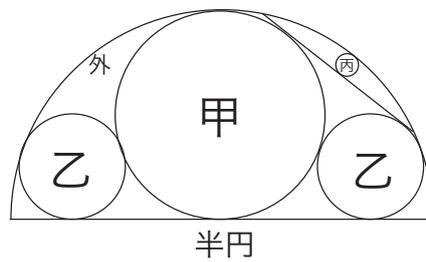
66 甲 = $\frac{1}{6}$ 大



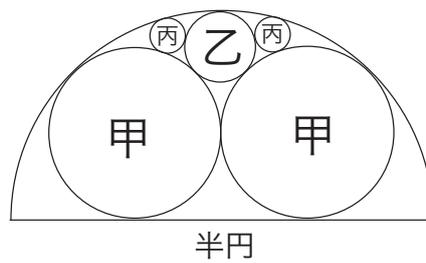
67 甲 + 乙 + 丙 + 丁 = $\frac{549}{520}$ 外



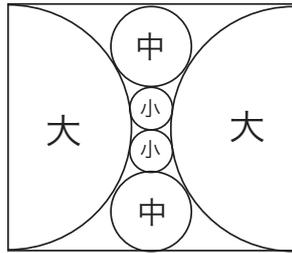
68 丙 = $\frac{1}{18}$ 外



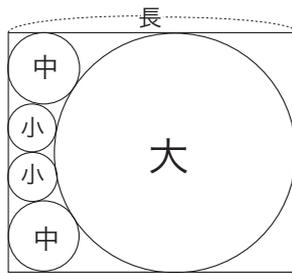
69 丙 = $\frac{1}{5}$ 甲



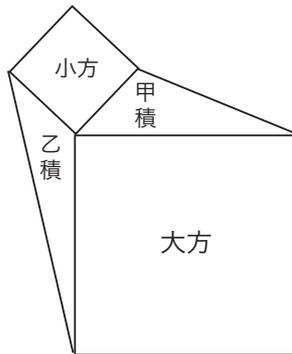
70 中 = $\frac{1}{3}$ 大



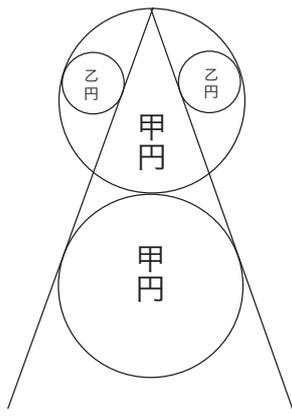
71 中 = $\frac{1}{4}$ 長



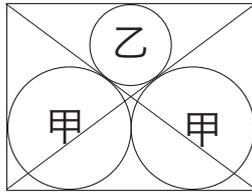
72 甲積 = 乙積



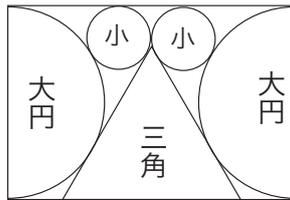
73 乙 = $\frac{1}{3}$ 甲



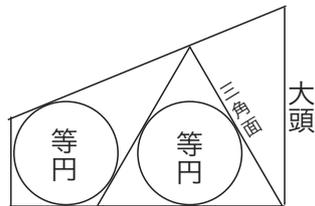
74 乙 = $\frac{2}{3}$ 甲



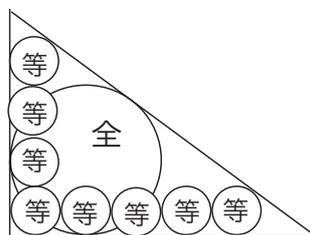
75 小 = $\frac{1}{3}$ 大



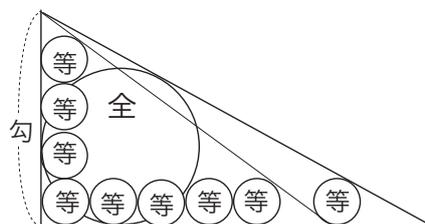
76 等 = $\frac{13}{24}$ 大頭



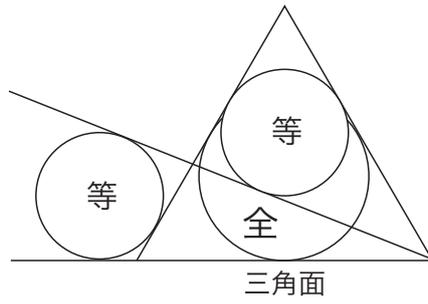
77 等 = $\frac{1}{3}$ 全



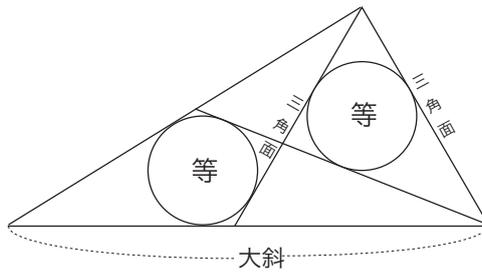
78 全 = $\frac{20}{27}$ 勾



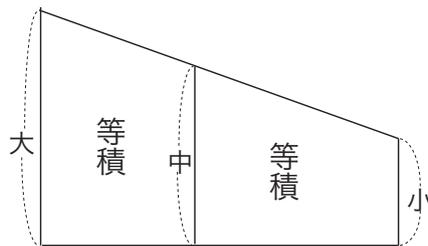
79 等 = $\frac{3}{4}$ 全



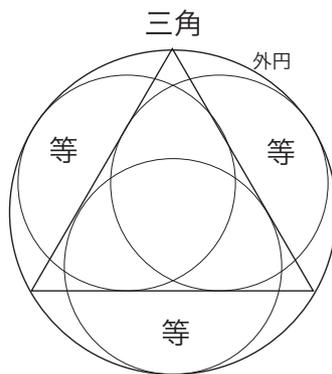
80 面 = $\frac{8}{15}$ 大斜



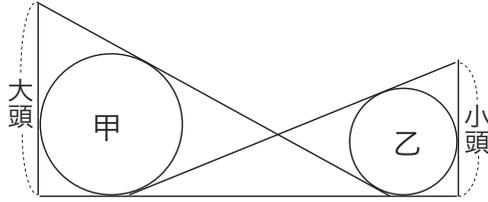
81 中 = $\sqrt{\frac{\text{大}^2 + \text{小}^2}{2}}$



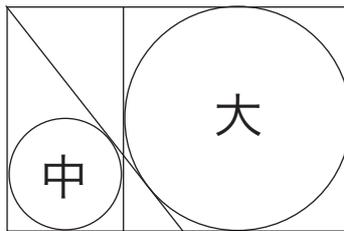
82 等 = $\frac{2}{3}$ 外



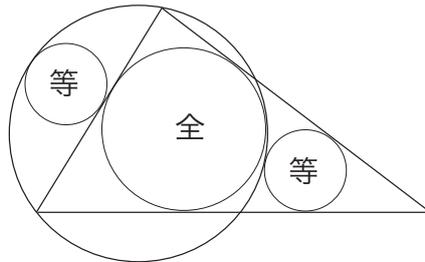
83 $\frac{1}{甲} - \frac{1}{乙} = \frac{1}{大} - \frac{1}{小}$



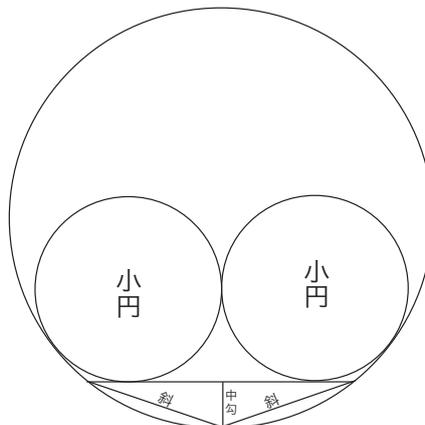
84 中 = $\frac{1}{2}$ 大



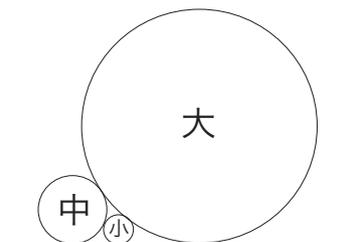
85 全 = 2 等



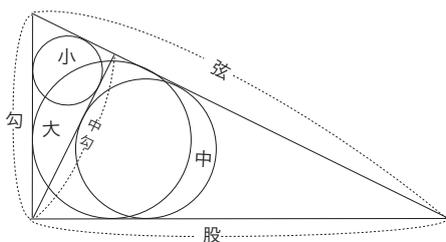
86 小 = 2(斜 - 中勾)



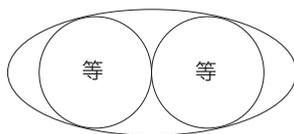
$$\boxed{87} \quad \frac{1}{\sqrt{\text{天}}} + \frac{1}{\sqrt{\text{甲}}} = \frac{1}{\sqrt{\text{小}}}$$



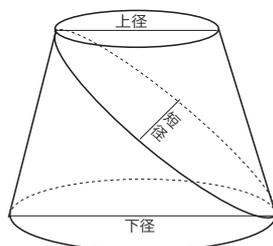
$$\boxed{88} \quad \text{中勾} = \frac{\text{大} + \text{中} + \text{小}}{2}$$



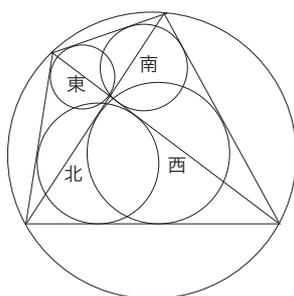
$$\boxed{89} \quad \text{等} = \frac{\text{短}}{\text{長}} \sqrt{\text{長}^2 - \text{短}^2}$$



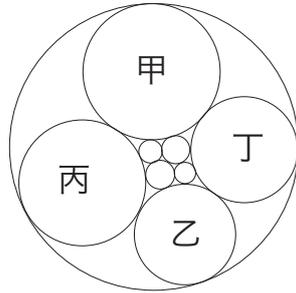
$$\boxed{90} \quad \text{短径}^2 = \text{上径} \times \text{下径}$$



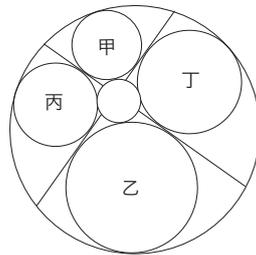
$$\boxed{91} \quad \text{東} + \text{西} = \text{南} + \text{北} \quad (\text{Japanese Theorem})$$



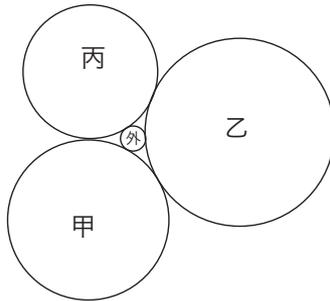
$$\boxed{92} \quad \frac{1}{\text{甲}} + \frac{1}{\text{乙}} = \frac{1}{\text{丙}} + \frac{1}{\text{丁}}$$



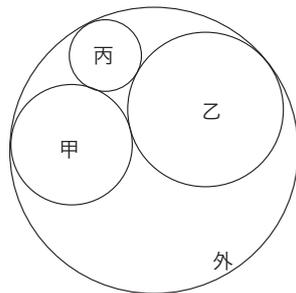
$$\boxed{93} \quad \frac{1}{\text{甲}} + \frac{1}{\text{乙}} = \frac{1}{\text{丙}} + \frac{1}{\text{丁}}$$



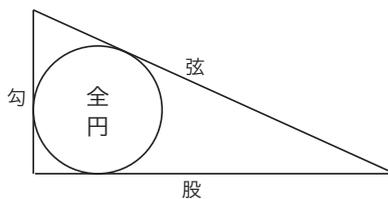
$$\boxed{94} \quad \left(\frac{1}{\text{甲}} + \frac{1}{\text{乙}} + \frac{1}{\text{丙}} + \frac{1}{\text{外}} \right)^2 = 2 \left(\frac{1}{\text{甲}^2} + \frac{1}{\text{乙}^2} + \frac{1}{\text{丙}^2} + \frac{1}{\text{外}^2} \right) \quad (\text{デカルトの円定理})$$



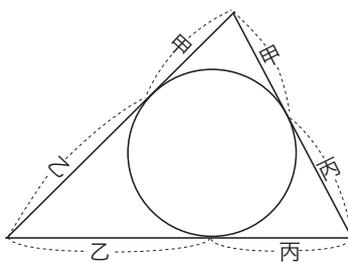
$$\boxed{95} \quad \left(\frac{1}{\text{甲}} + \frac{1}{\text{乙}} + \frac{1}{\text{丙}} - \frac{1}{\text{外}} \right)^2 = 2 \left(\frac{1}{\text{甲}^2} + \frac{1}{\text{乙}^2} + \frac{1}{\text{丙}^2} + \frac{1}{\text{外}^2} \right) \quad (\text{デカルトの円定理})$$



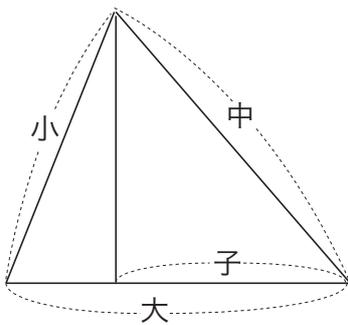
96 全 = 勾 + 股 - 弦



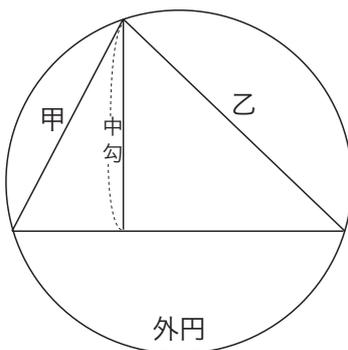
97 三角形の面積 = $\sqrt{(甲 + 乙 + 丙) 甲乙丙}$ (ヘロンの公式)



98 子 = $\frac{大^2 + 中^2 - 小^2}{2大}$ (余弦定理)



99 甲 × 乙 = 中勾 × 外 (正弦定理)



100 甲 × 丁 = 乙 × 丙 (大原の定理)

