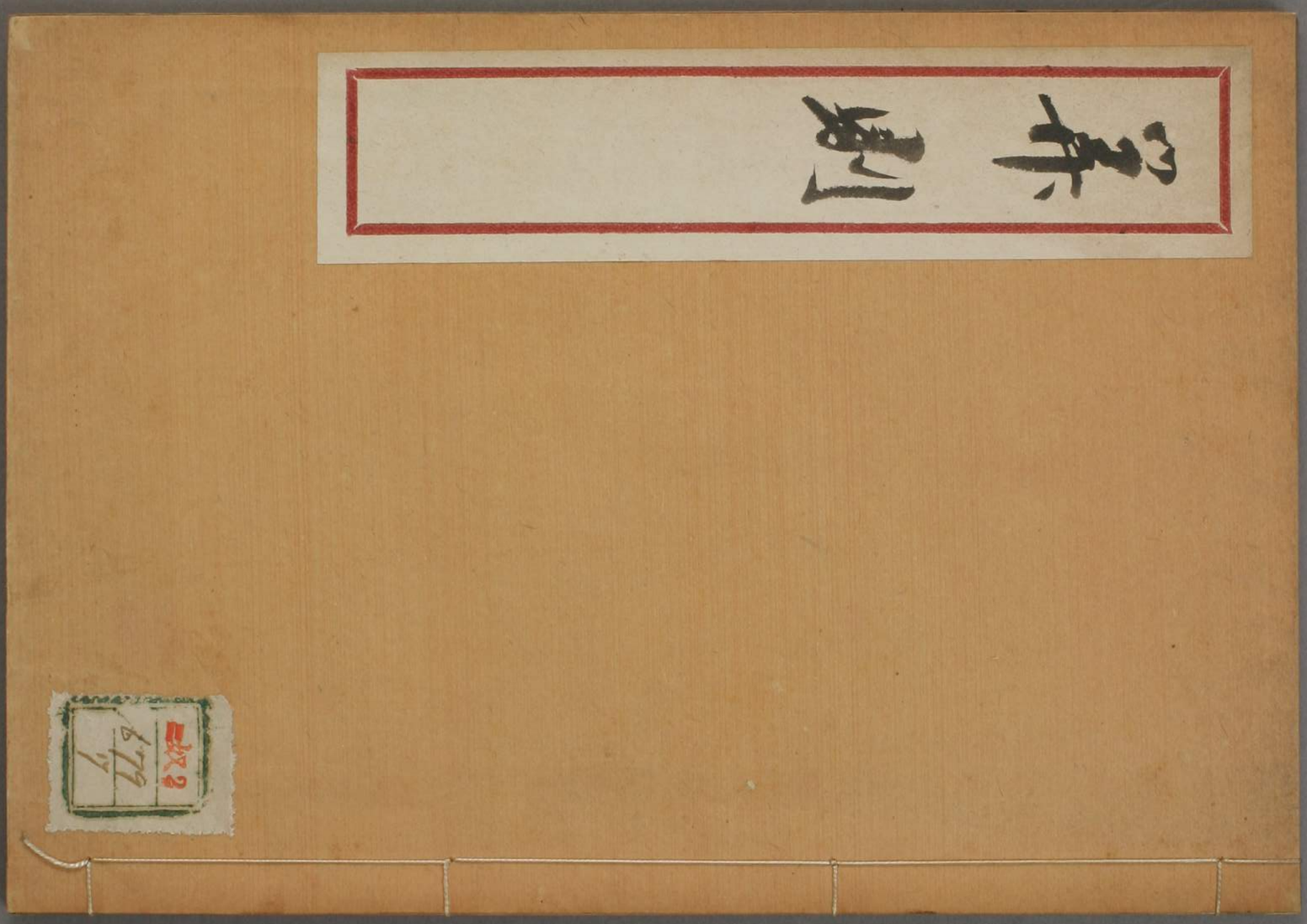

宮城縣図書館

門 二 2
號
卷

算則卷之九

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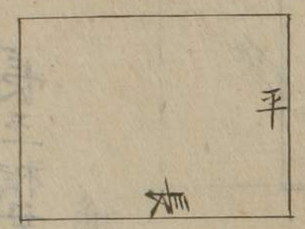
求積圖解

今有平直長四寸平三寸問積

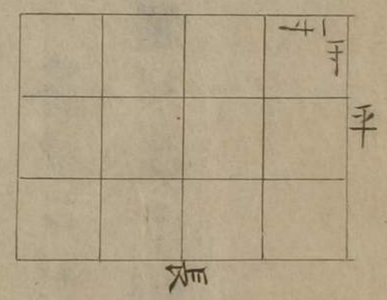
答曰一十二步

術曰長平相乘得積

解



長平相乘圖



平方

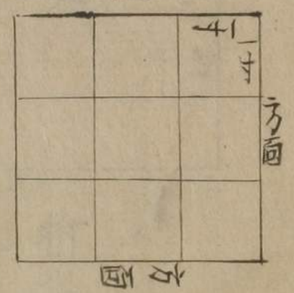
解

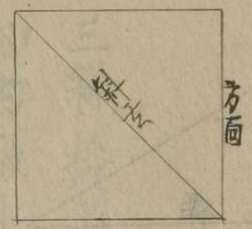
今有平方面三寸問積

答曰積九歩

術曰方面自乘得積

方面自乘圖





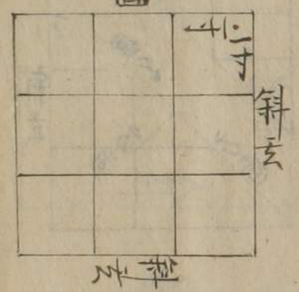
解

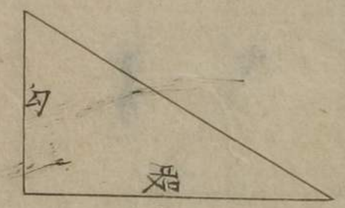
今有平方斜弦三寸問積

答曰積四歩半

術曰斜弦自乘半之得積

斜弦自乘圖





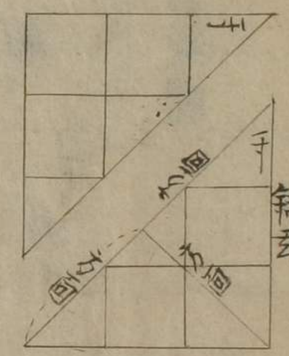
解

今有鈎股鈎三十股四十問積

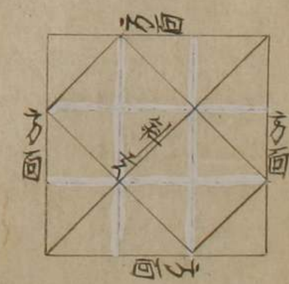
答曰積六步

術曰鈎股相乘折半之得積

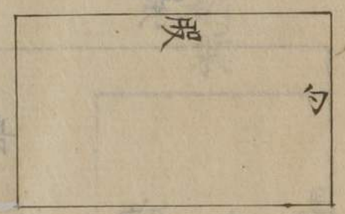
折半



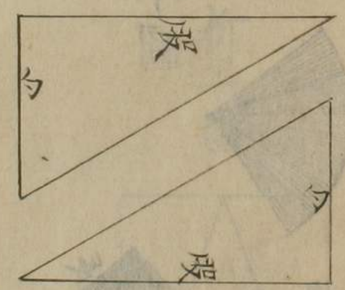
変圖



鈎股相乘



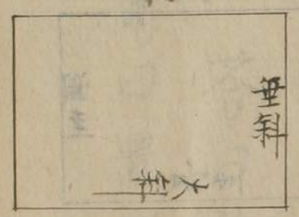
折半圖



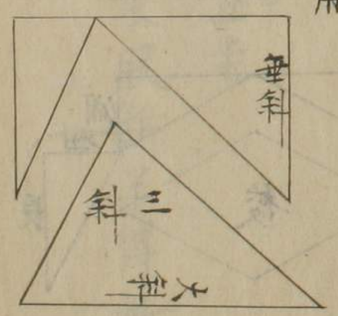
三斜校圭圭円等求積者兩寸相乘折半之意

如勾股術故畧題辭而述圖解

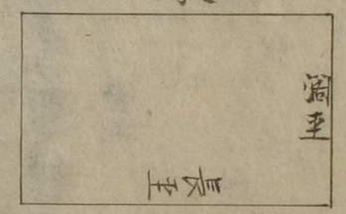
垂斜人斜相乘



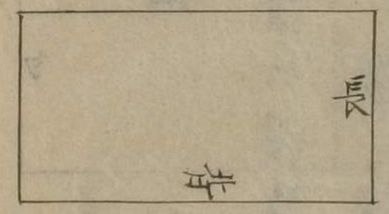
折半圖



長径濶径相乗

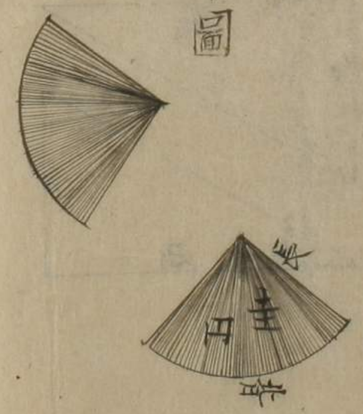


長背相乗

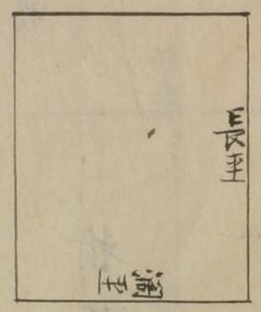


折半圖

折半圖

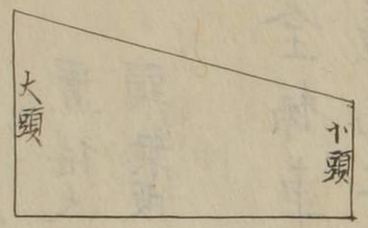


長径濶径相乗



折半圖

解



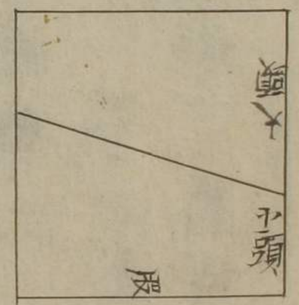
今有梯小頭二寸大頭八寸服二十一寸

問積

答曰積一百〇五歩

術曰置併大小頭乗服折半得積

置倅大小
頭乘股



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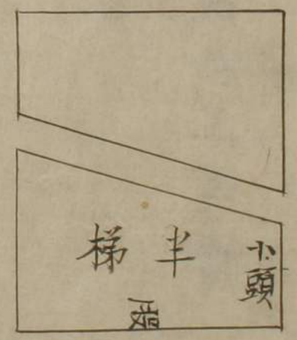
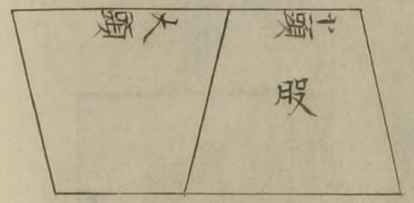


全梯車輞等求積者兩寸置倅乘濶折半之
意如半梯術故畧題辭而述圖解

大小頭置
倅乘股



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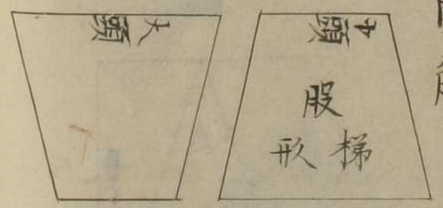
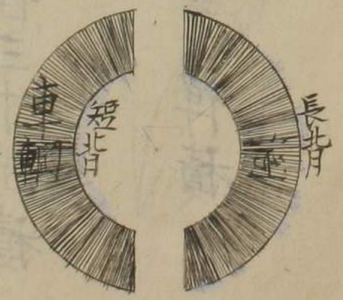


長短背置
倅乘濶

折半圖

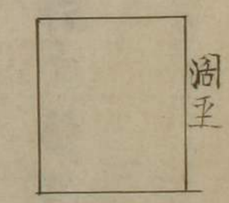


濶徑

解

今有帶直円長徑三寸濶徑二寸問
積
答曰積五歩一四一五九二
術曰濶徑円率相乘加長徑減濶徑
餘乘濶徑得積

長濶至差
乘濶徑



濶徑自乘
乘円率

二和圖

此術之括式
如本文之術

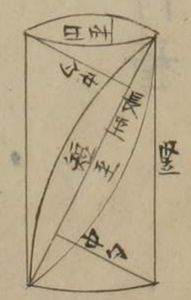
今有側円長徑四寸短徑三寸問積

答曰積九歩 四二四 七七六

術曰長短徑相乘乘円率得積

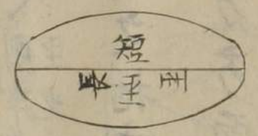
解

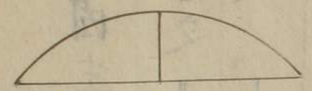
円徑自乘乘
以三及円率



此術之括式
如本文之術

以中勺除之圖





今有弧矢二寸弦八寸問積

答曰積一十一歩 三〇九七 三一二

術曰弦倍之加矢乘矢及率 三分一四 一五九二 得積

解

此術因半円發之故近半円者親也徧円者疎也

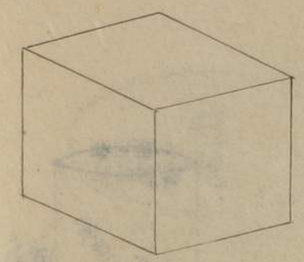
弦倍之 弦　　変之 幅　　又変之 半

加矢 矢　　半

乘周率 半周　　乘矢 則半径也　　半径周　　変之 半

十除之 半貫　　半貫

此術之括式如本文之術



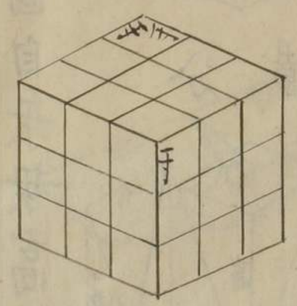
今有立方方面三寸問積

答曰積二十七歩

術曰方面再自乘之得積

解

方面再自乘圖

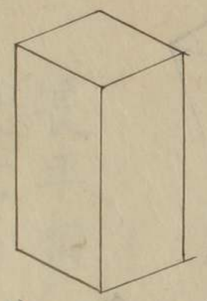


今有方堡壔方面三寸高五寸問積

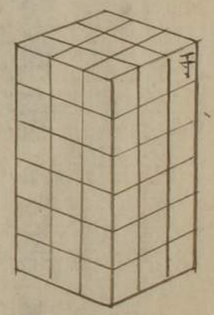
答曰積四十五歩

術曰方面自乘乘高得積

解



方面自乘乘高圖

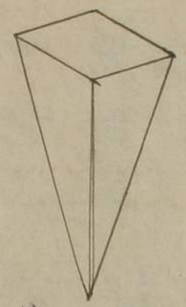


今有方錐方面七寸高九寸問積

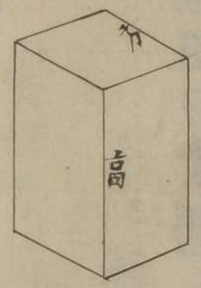
答曰積百四十七歩

術曰方面自乘乘高三除之得積

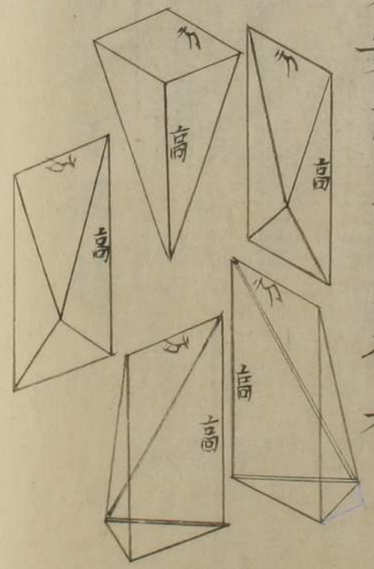
解



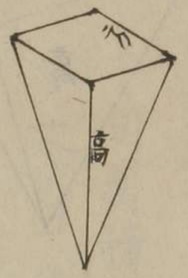
方面自乘乘竪

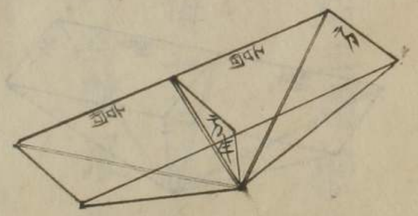


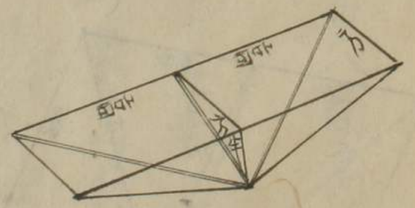
分截



三除圖

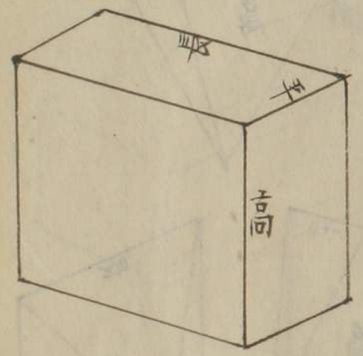


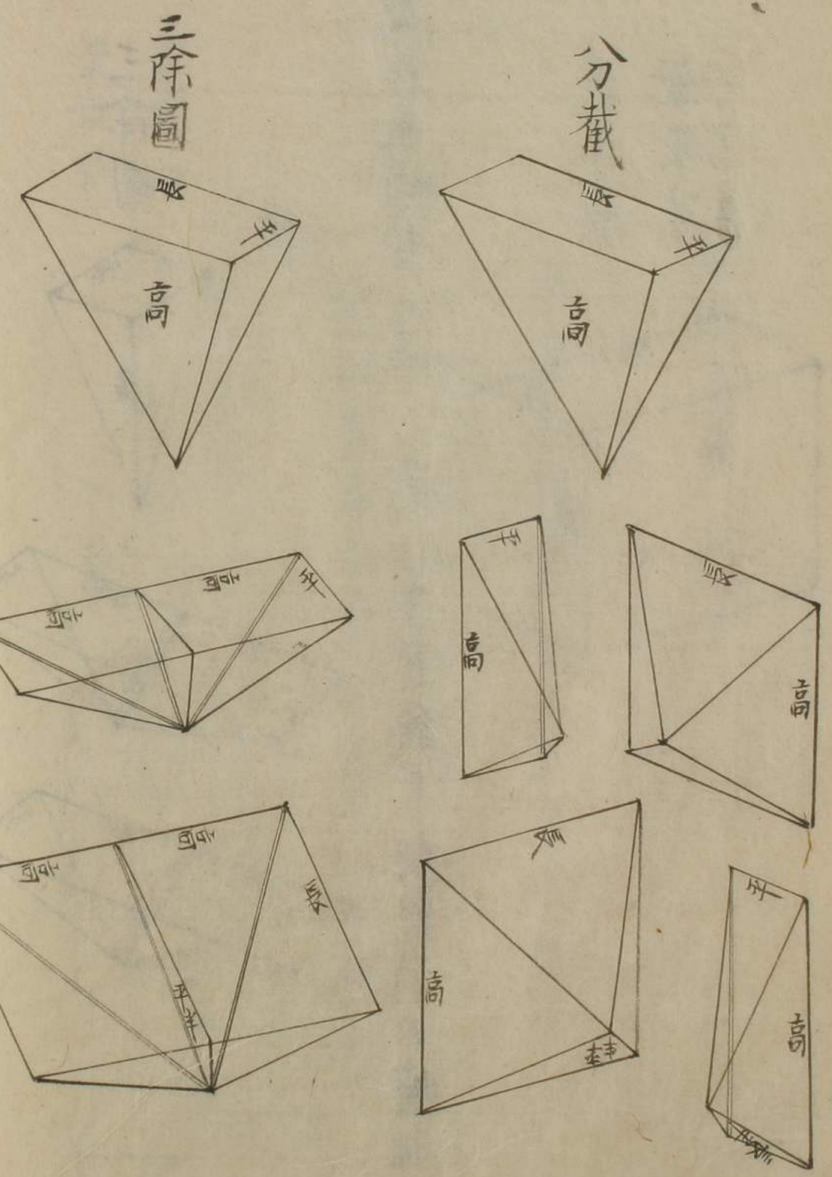




直錐求積者三帰之意如方錐故畧題辭而述圖解

長平相乘乘高

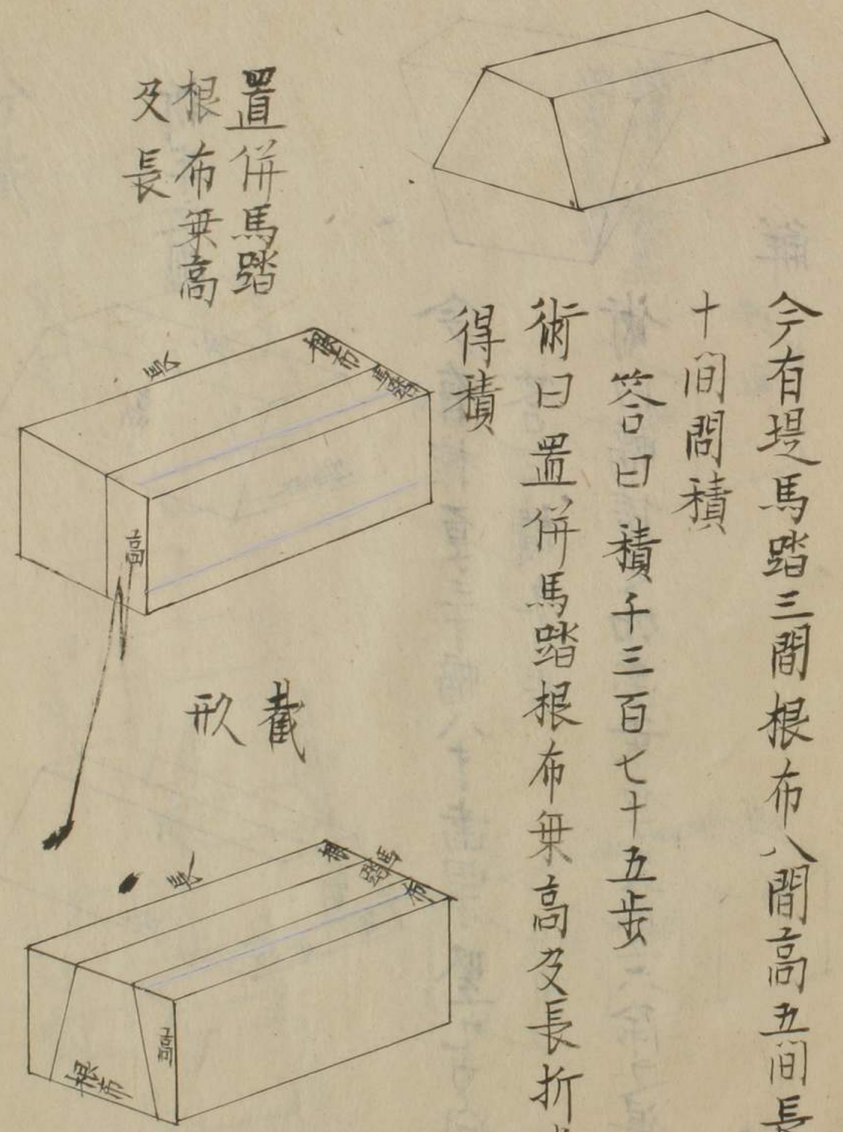




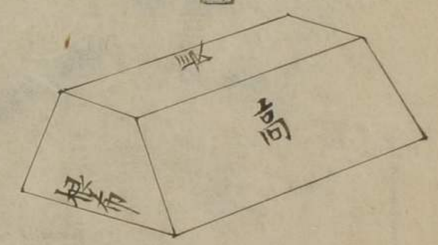
今有堤馬踏三間根布八間高五間長五十間問積

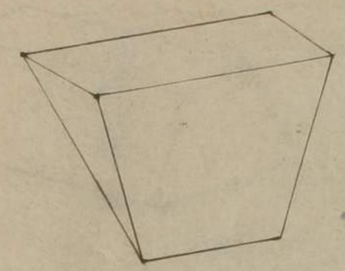
答曰積千三百七十五歩

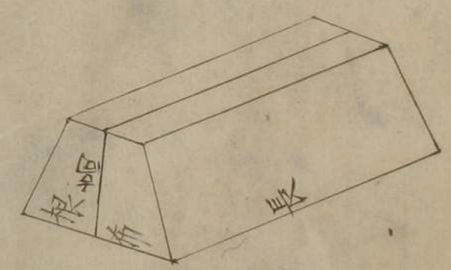
術曰置併馬踏根布乘高及長折半之得積



折半之圖







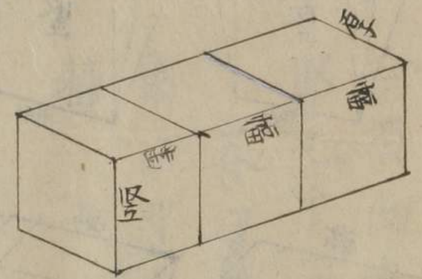
今有榨厚三寸幅八寸齒四寸竪九寸問積

答曰積九十歩

術曰幅倍之加齒乘厚及竪六除之得積

解

幅倍之加齒乘厚及竪



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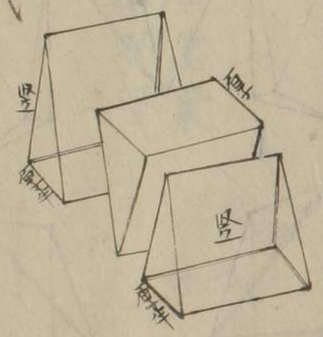
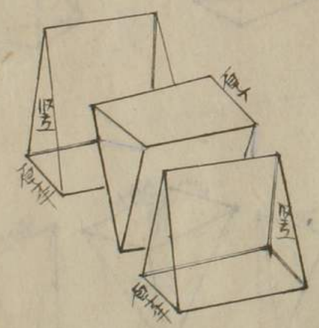
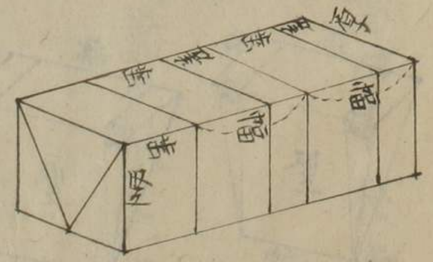
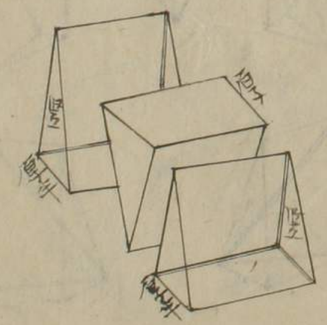
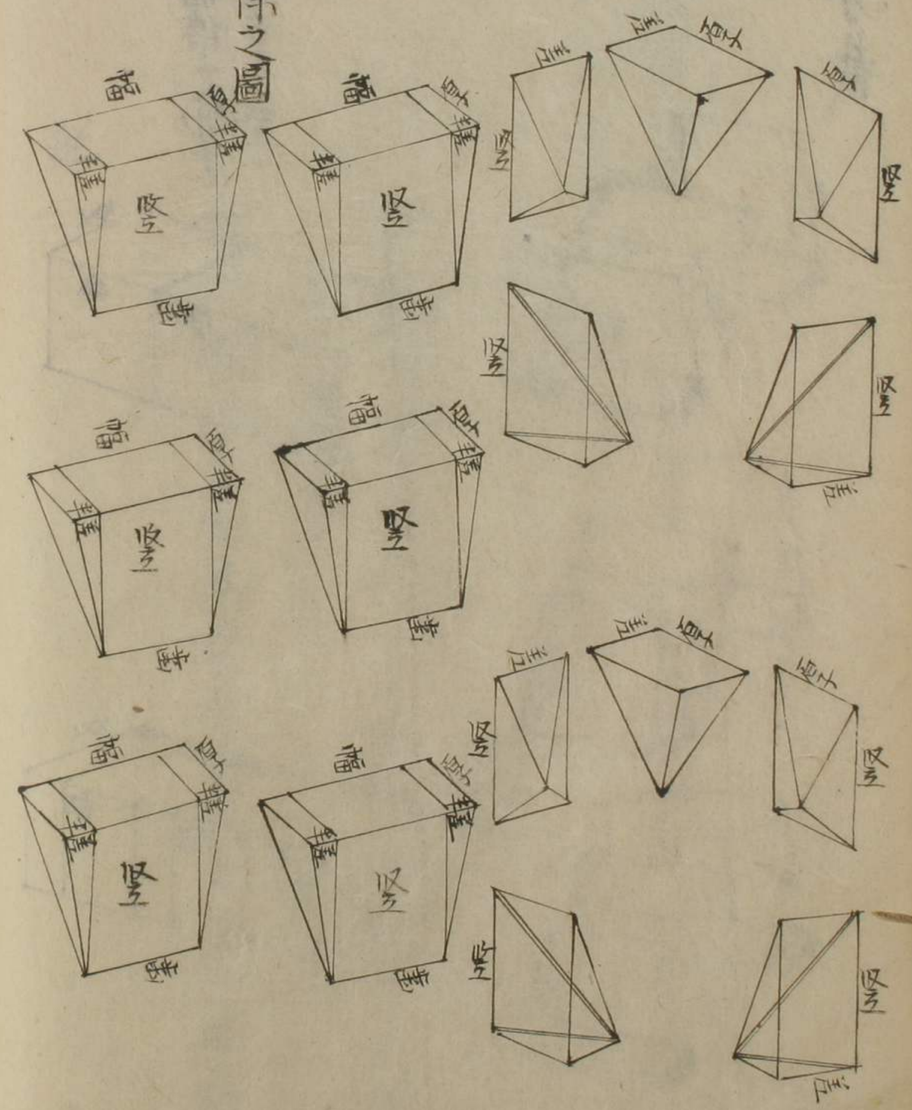








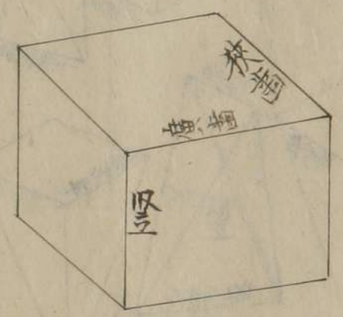
六除之圖



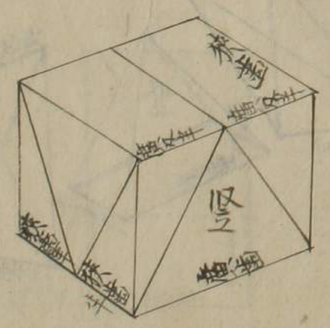
今有兩歩堦廣歩四十狹歩三十
竪九十問積
荅曰積十八歩
術曰置廣歩與狹歩及竪六除之得
積

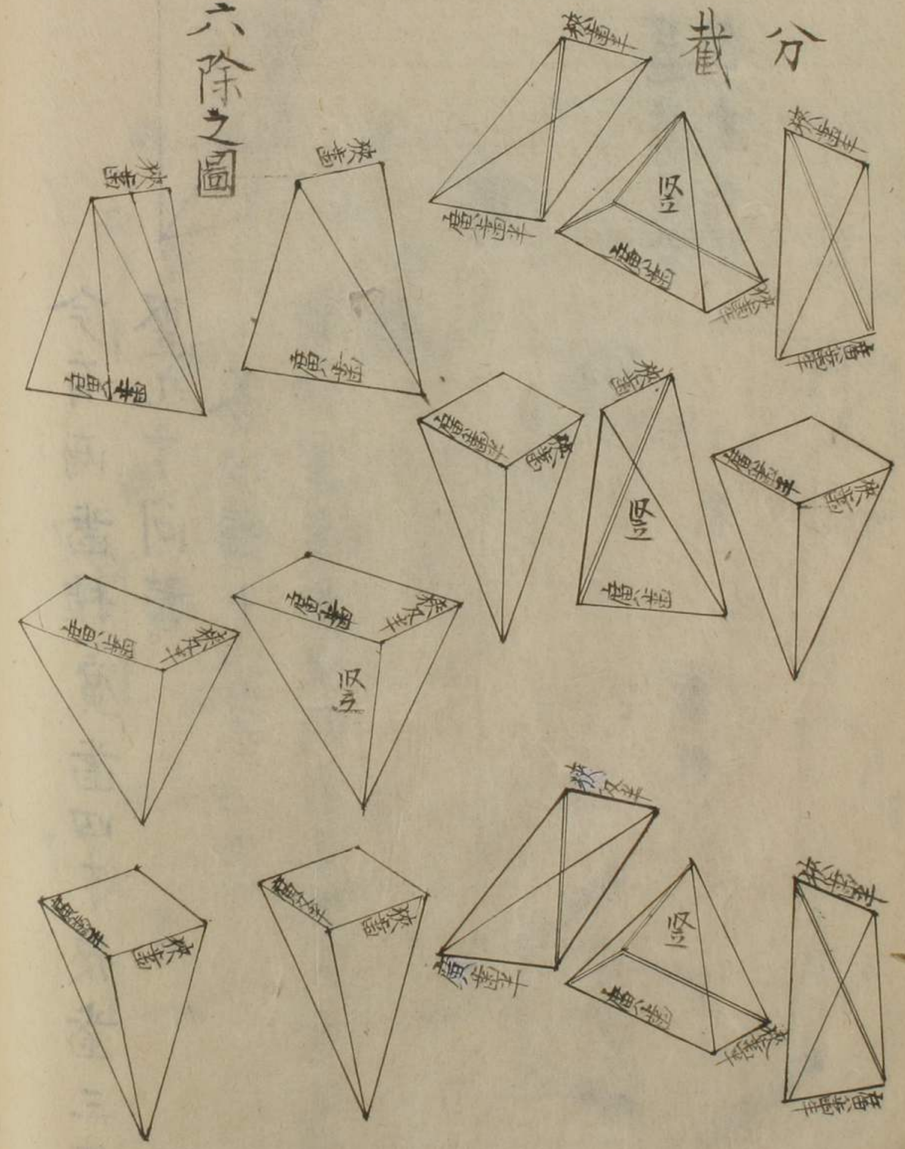
解

置廣歩與
狹歩及竪



截形





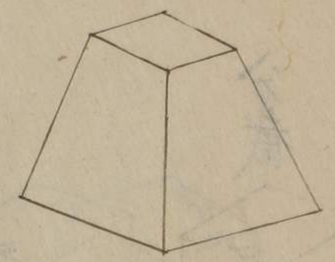
今有方臺上方二寸下方八寸竪九寸問積

答曰積二百五十二歩

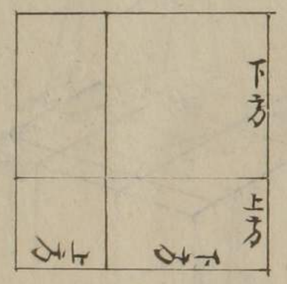
術曰上下方和自乘丹減上下方相乘餘乘

竪三除之得積

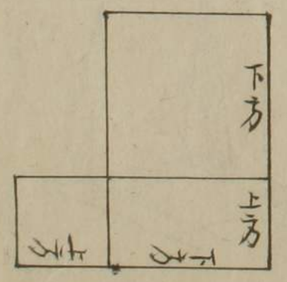
解



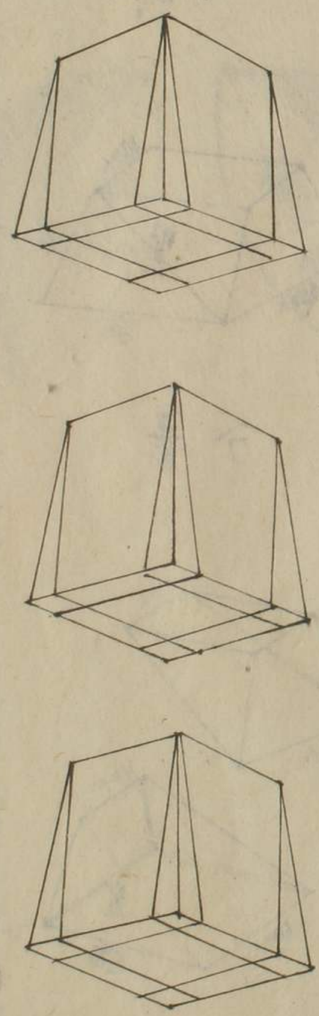
上方下方
和而自乘

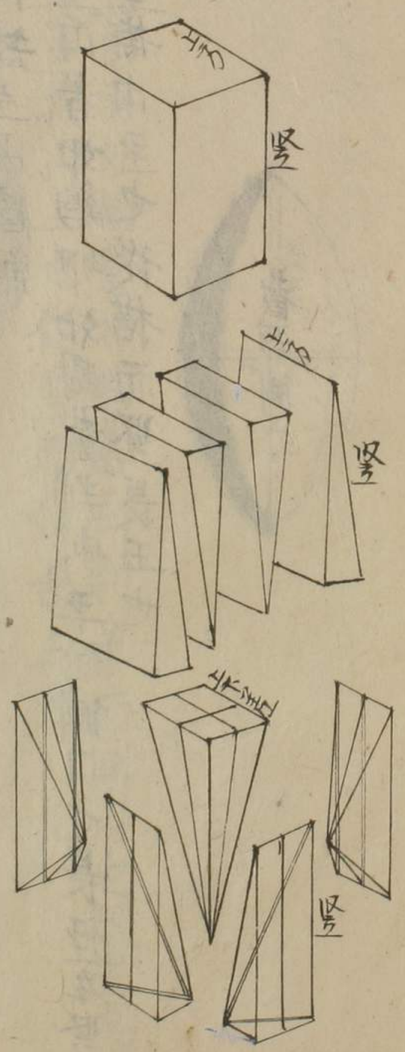


丹減上下
方相乘余

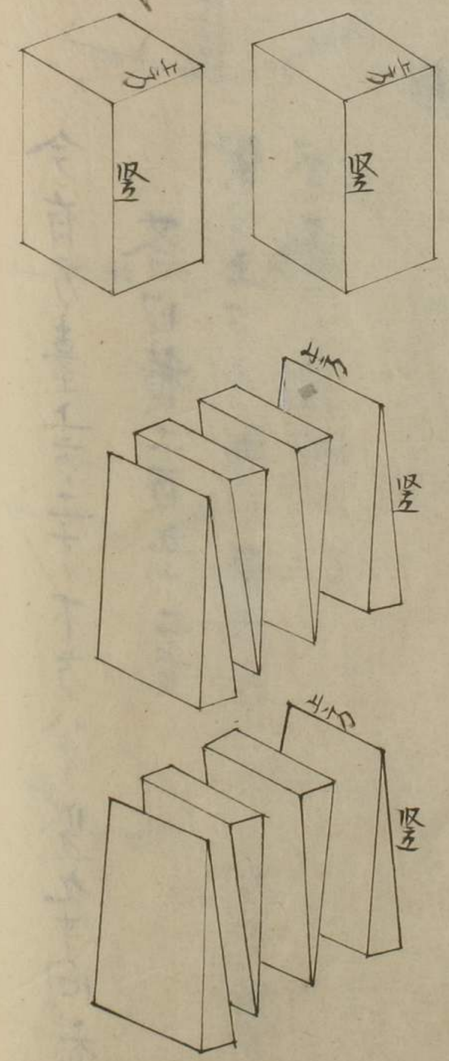


三角錐之圖

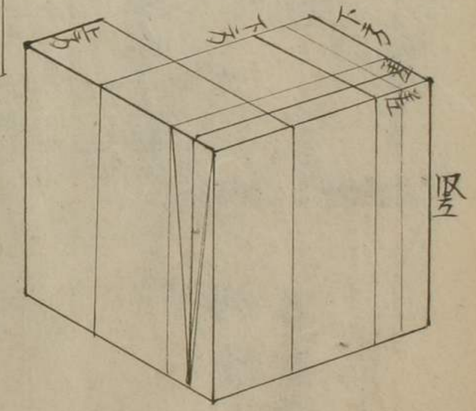




分截

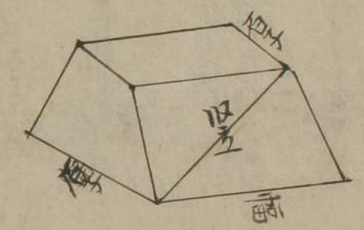


兼竪截形

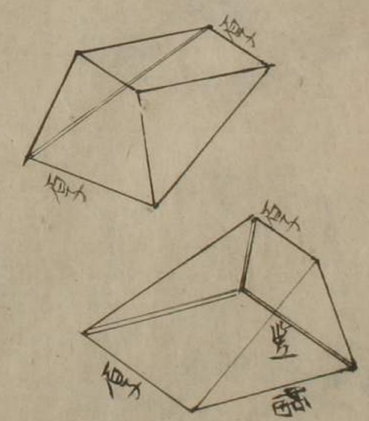


厚幅臺者榨形二箇合和之形也故畧辭題而述圖解

截形

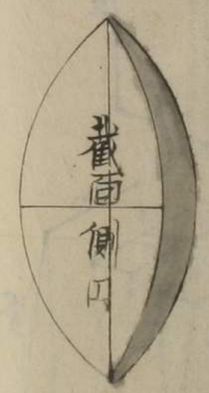


截分

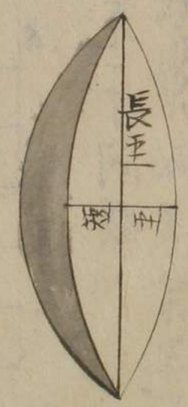


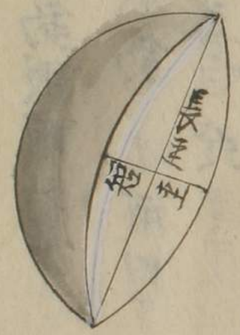
長立円矮立円圖解

長立円者如鷄卵如圖截判則平面側円也長徑為竪短至擬円至也從横而竪長至也



矮立円者如圖橐如圖截判則平面側円也短至為竪長至擬円至也從竪而横長至也





鈎股圖解

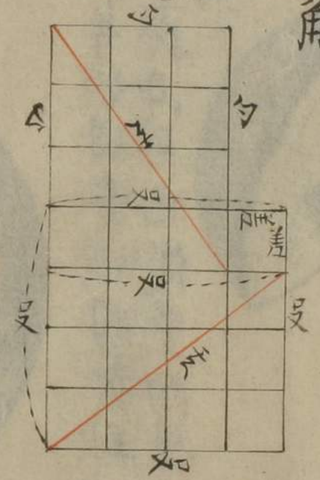
今有勾股鈎三寸股四寸問弦

答曰弦五寸

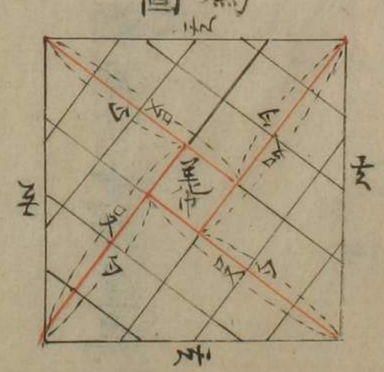
術曰置勾冪股冪兩平方得弦

解

置併鈎冪股冪



變之為玄冪圖

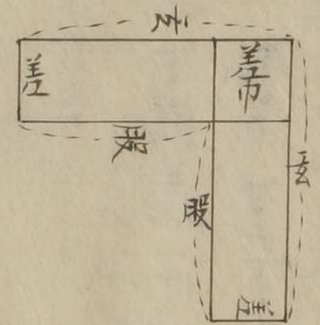


勾三寸股玄差一寸問股

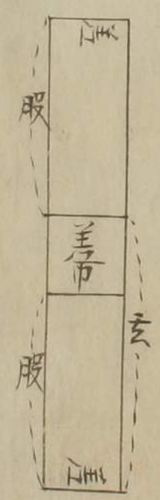
答曰股四寸

術曰以差除勾冪減差余半之得股

解



變之



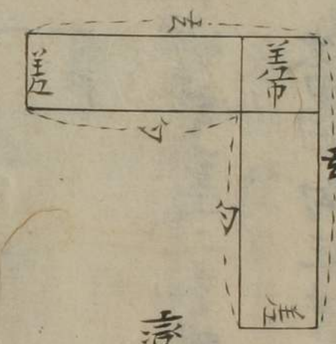
股四寸勾玄差二寸問勾

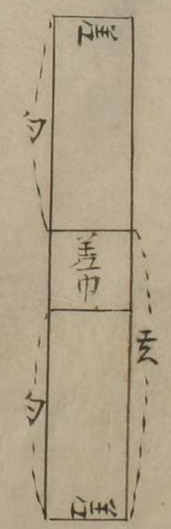
答曰勾三寸

術曰以差除股冪減差餘半之得勾

解

股巾





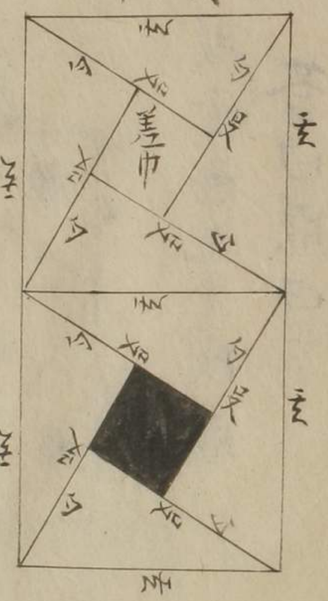
倉之

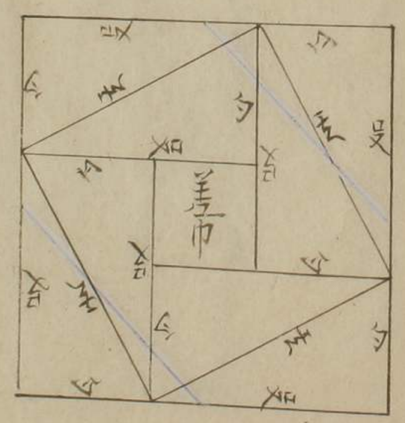
玄五寸勾股差一寸問勾

答曰勾三寸

術曰玄巾二段減差巾餘冪平方得勾及和減差余半之得勾

解





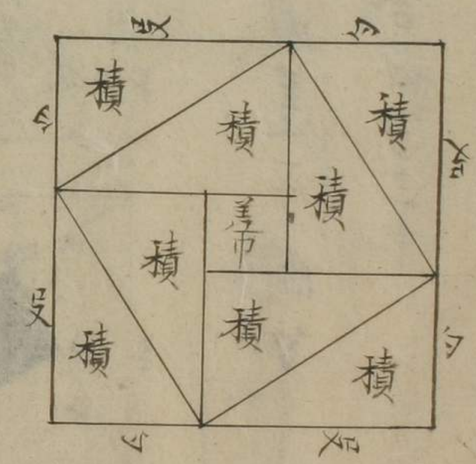
積六步勾股差一寸問勾

答曰勾三寸

術曰積八之加差巾冪平方得勾及和減差余半之得勾

解

積八段
加差巾

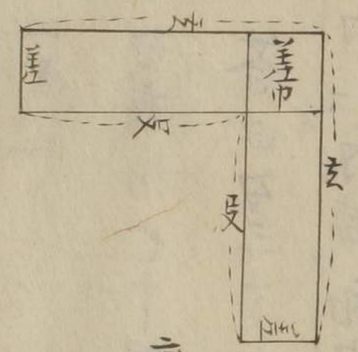


勾三寸股玄和九寸問股

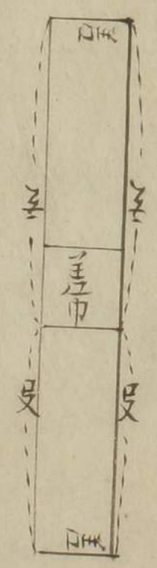
答曰股四寸

術曰以和除勾巾以減和余半之得玄

解



變之

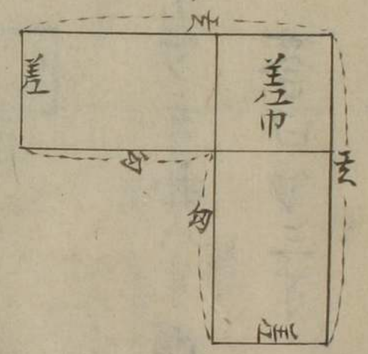


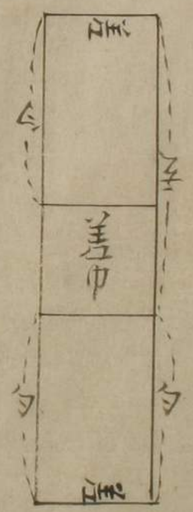
股四寸勾玄和八寸問勾

答曰勾三寸

術曰以和除股卑以減和余半之得勾

解





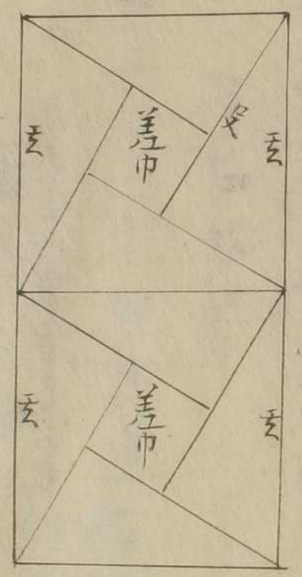
変之

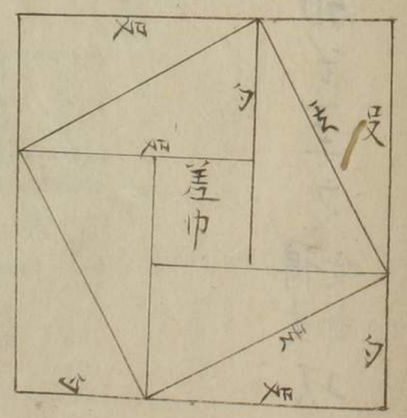
玄五寸勾股和七寸問勾

答曰勾三寸

術曰玄巾二段冪減和巾余冪平方得勾又差以減和余半之得勾

解





餘

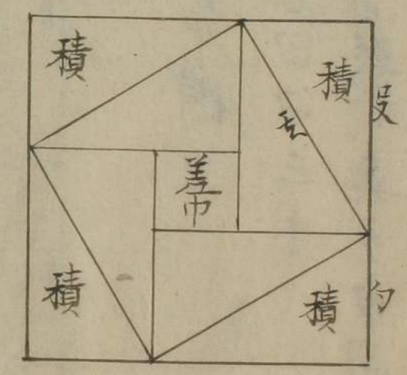
積六歩玄五寸問勾

答曰勾三寸

術曰置併四段積與玄巾冪平方得勾又和玄巾冪減四段積余冪平方得勾又差以減和余半之得勾

解

置併四段
積與玄巾



玄巾冪減
四段積余 差冪

勾股玄和十二寸 勾股差一寸問勾

答曰勾三寸

術曰置併和巾二段差巾冪平方加差半之得股玄和以減玄和余得勾

解

和巾二段

勾的	勾股玄	勾股玄	勾股玄	勾股玄	勾股玄
勾股玄	股巾	勾股玄	勾股玄	勾股玄	勾股玄
勾股玄	股巾	勾股玄	玄巾	股巾	玄巾

勾股玄和十二寸股玄差一寸問勾

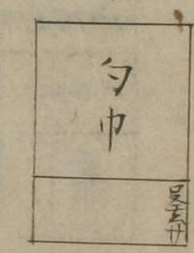
答曰勾三寸

變之加差巾

玄巾	股巾	勾股玄	玄巾
勾股玄	勾股玄	勾股玄	勾股玄
勾股玄	勾股玄	勾股玄	勾股玄
玄巾	股巾	勾股玄	玄巾

術曰和差相乘加差半巾開平方減差半余得勾

解

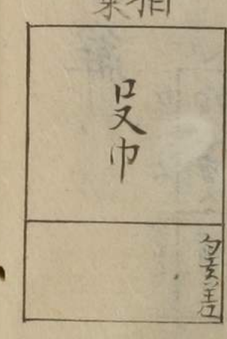


勾股玄和十二寸勾玄差二寸問股

答曰四寸

術曰和差相乘加差半巾開平方減差半余得勾

解



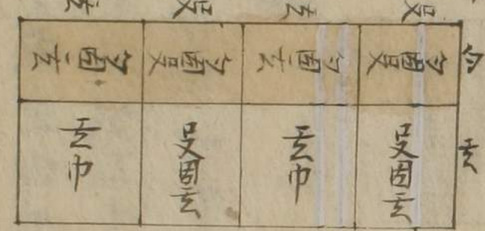
勾股和七寸股玄和九寸問勾

答曰勾三寸

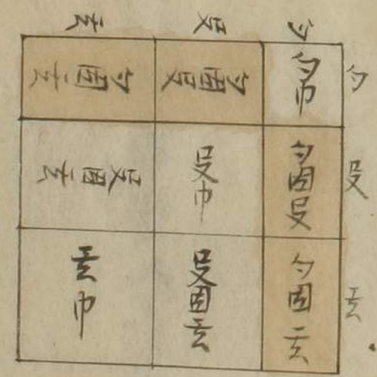
術曰前後和差後和相乘二段開平方得股玄和與勾差以減後和余得勾

解

前後和
差後和
相乘二段



變方



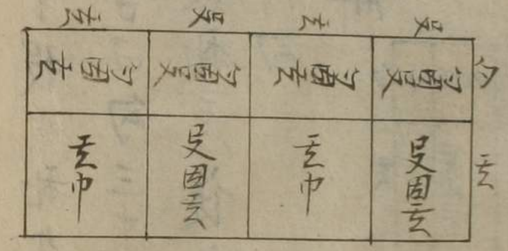
勾玄和八寸股玄和九寸問勾

答曰勾三寸

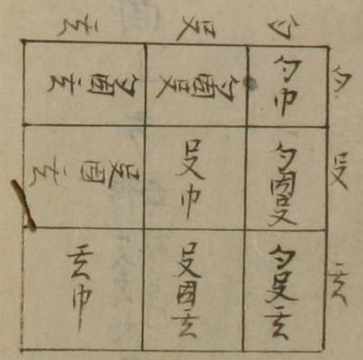
術曰前後和相乗二段開平方得勾股三和減後和余得勾

解

前後和
相乗二段



変之



勾玄和八寸勾股和七寸問勾

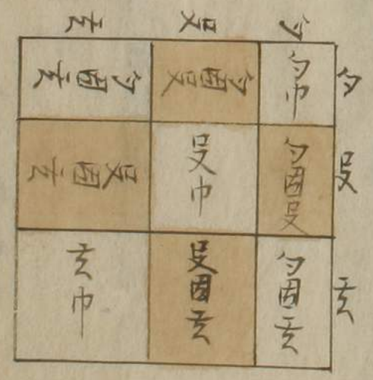
答曰勾三寸

術曰前後和差前和相乗二段開平方得勾玄和減前後和差余得勾

解

前後和
差前和
相乗二段

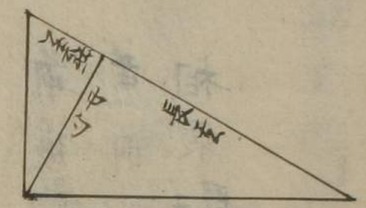
変之



長玄三寸二分短玄一寸八分問中勾

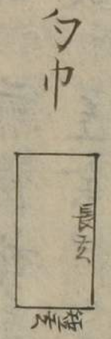
答曰中勾二寸四分

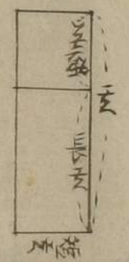
術曰長短玄相乘冪平方得中勾



解

故勾中





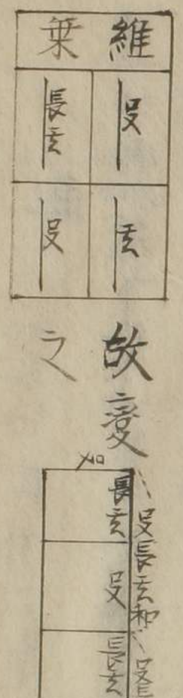
以減短玄中余為中

股玄和九寸長玄三寸二分問股

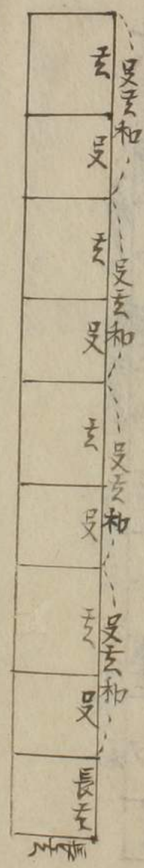
答曰股四寸

術曰置併和四段長玄乘長玄冪平方減長玄余半之得股

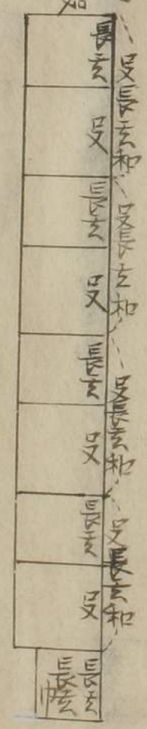
解



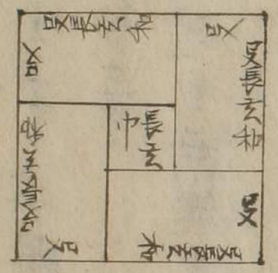
置併和四段長玄乘長玄



故憂之



又憂之

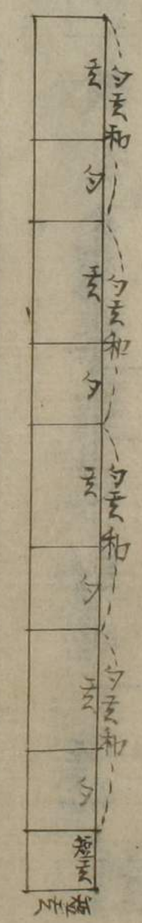


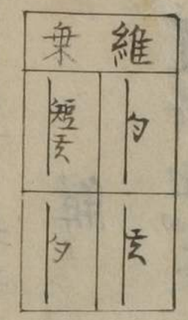
勾玄和八寸短玄一寸八分問勾

答曰勾三寸

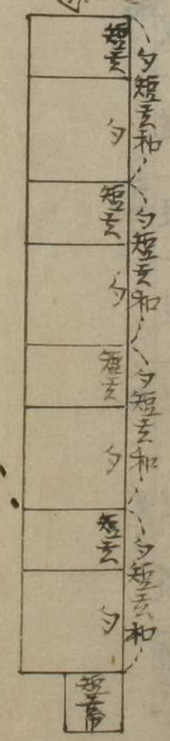
術曰置併和四段短玄乘短玄開平方減短玄余半之得勾

解

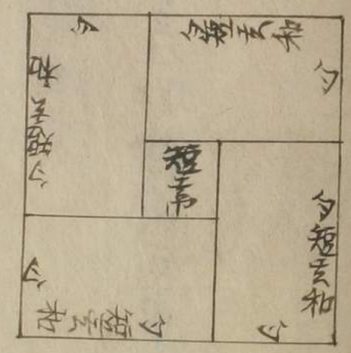


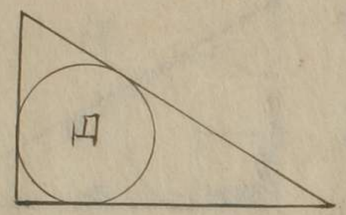


故倍之



又倍之



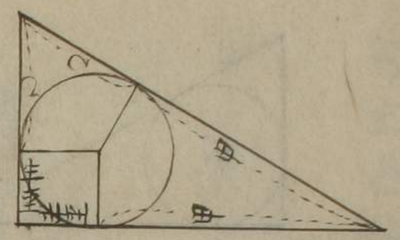


解

勾三寸股四寸問円径

答曰円径二寸

術曰求玄置併勾股減玄余得円径



乙 半玉 八勾

甲 半玉 八股

甲 乙 八弦

置併勾股減弦余半玉 半玉 変之 四玉

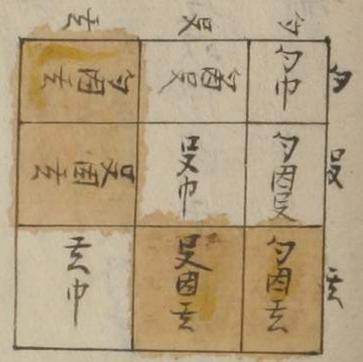
勾三寸四玉二寸問股

答曰股四寸

術曰以勾四玉差五段除四玉巾加四玉得股

解

四徑巾



変之

勾四差 八 股弦差

勾差四倍 八 股

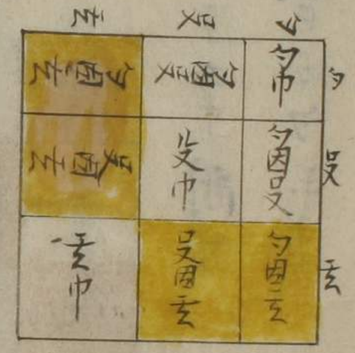
股四寸四徑二寸問勾

答曰勾三寸

術曰以股四玉差二段除四玉巾加四徑得勾

解

円径巾



変之

玄五寸円亜二寸問勾

答曰勾三寸

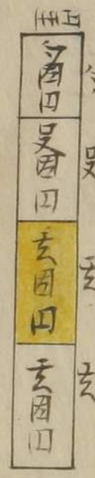
術曰玄円亜差玄相乗仍減玄円亜和円亜相乗余開平方得勾股差以併減玄円亜余半之得勾

解

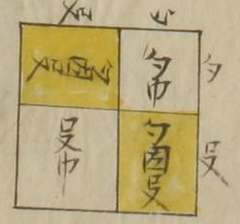
玄円亜差

玄相乗

亜相乗



余



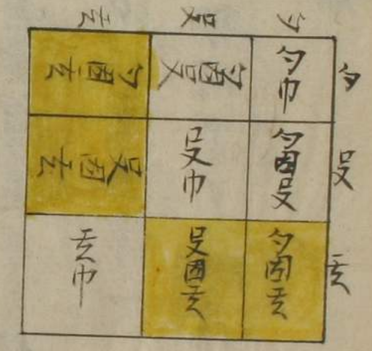
中勾二寸四分円径二寸問玄

答曰玄五寸

術曰以中勾円亜差二段除円径巾得玄

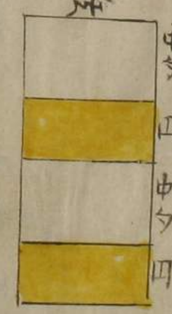
解

円徑巾



変之

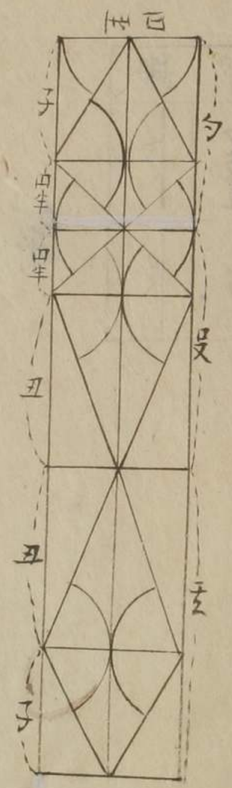
又変之

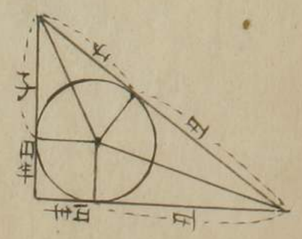


積六歩円径二十間　答曰玄五寸

術曰以円径除四段積得勾股和減円径余半之得玄

解

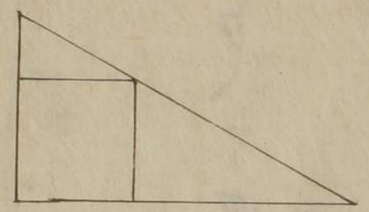


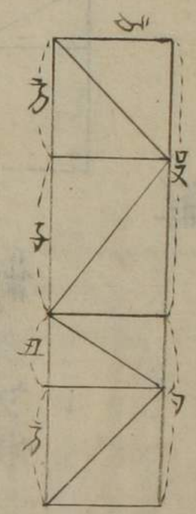


勾八寸四分股十一寸二分問方面　答曰方面四寸八分

術曰勾股相乗為実以勾股和除之得方面

解





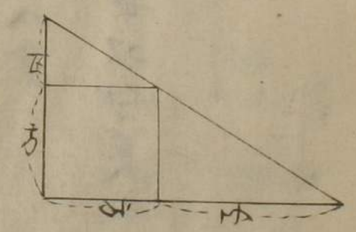
勾八寸四分方面四寸八分問股

答曰股十一寸二分

術曰勾方相乘為実以勾方差除之得股

解

維	勾
乘	勾方差
	股
	方



股十一寸二分方面四寸八分問勾

答曰勾八寸四分

術曰股方相乘為実以股方差除之得勾

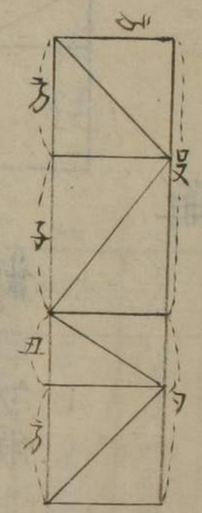
解

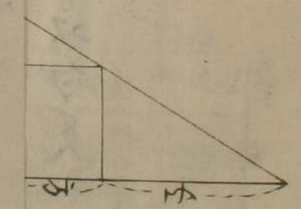
維	勾
乘	股
	方
	股方差

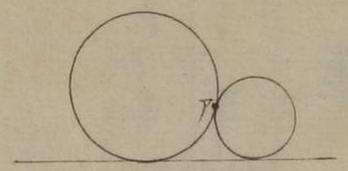
玄十四寸方面四寸八分問中勾

答曰中勾六寸七分二厘

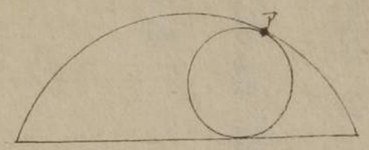
術曰置併玄巾方巾開平方加方得勾股和







如畫大円ノア点ニ接レテ小円ヲ画ク如何



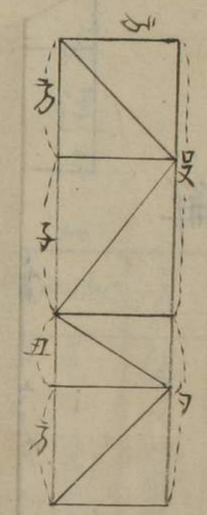
如畫弧ノ一端ア点ニ接シ小円ヲ画ク如何

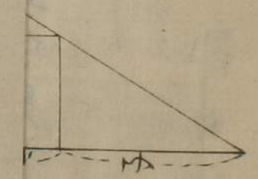
玄十四寸方面四寸八分問中勾

答曰中勾六寸七分二厘

術曰置併玄巾方巾開平方加方得勾股和

勾術





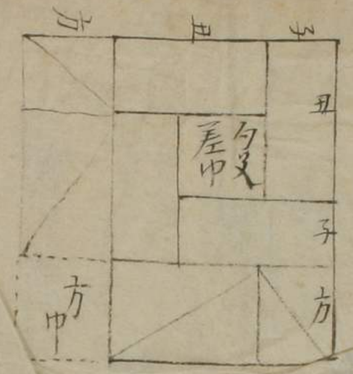
股術

玄十四寸方面四寸八分問中勾

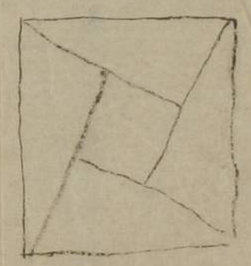
答曰中勾六寸七分二厘

術曰置併玄巾方巾開平方加方得勾股和

算則巻之九畢



玄巾方巾和



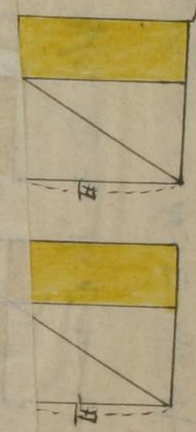
玄巾方巾相併開平方子丑方ノ和ヲ得ル

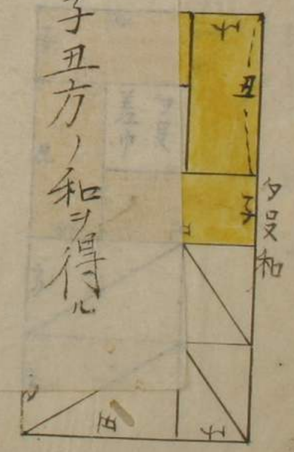
方一段ヲ加ヘ勾股和ヲ得ル

勾股和方面相乗玄三隅キ中勾ヲ得ル

解

玄巾





算則卷之九畢