

Chinese problems

Chinese Mathematics History Topics Index

[Version for printing](#)

We give here a collection of Chinese problems which are extracted from various articles in our archive on Chinese mathematics or Chinese mathematicians. Many of the problems have answers given in the corresponding article, and some have a description of the method. Each problem has a reference to the article in which it occurs.

Problem 1: See [Nine Chapters](#)

A good runner can go 100 paces while a poor runner covers 60 paces. The poor runner has covered a distance of 100 paces before the good runner sets off in pursuit. How many paces does it take the good runner before he catches up the poor runner.

Problem 2: See [Cheng Dawei](#)

Boy shepherd B with his one sheep behind him asked shepherd A "Are there 100 sheep in your flock?". Shepherd A replies "Yet add the same flock, the same flock again, half, one quarter flock and your sheep. There are then 100 sheep altogether." How many sheep is in shepherd A's flock?

Problem 3: See [Yang Hui](#)

Now 1 cubic cun of jade weighs 7 liang, and 1 cubic cun of rock weighs 6 liang. Now there is a cube of side 3 cun consisting of a mixture of jade and rock which weighs 11 jin. Tell: what are the weights of jade and rock in the cube. [Note 1 jin = 16 liang]

Problem 4: See [Sun Zi](#)

Suppose that, after going through a town gate, you see 9 dykes, with 9 trees on each dyke, 9 branches on each tree, 9 nests on each branch, and 9 birds in each nest, where each bird has 9 fledglings and each fledgling has 9 feathers with 9 different colours in each feather. How many are there of each?

Problem 5: See [Nine Chapters](#)

Certain items are purchased jointly. If each person pays 8 coins, the surplus is 3 coins, and if each person gives 7 coins, the deficiency is 4 coins. Find the number of people and the total cost of the items.

Problem 6: See [Nine Chapters](#)

There are two piles, one containing 9 gold coins and the other 11 silver coins. The two piles of coins weigh the same. One coin is taken from each pile and put into the other. It is now found that the pile of mainly gold coins weighs 13 units less than the pile of mainly silver coins. Find the weight of a silver coin and of a gold coin.

Problem 7: See [Nine Chapters](#)

There is a square town of unknown dimensions. There is a gate in the middle of each side. Twenty paces outside the North Gate is a tree. If one leaves the town by the South Gate, walks 14 paces due south, then walks due west for 1775 paces, the tree will just come into view. What are the dimensions of the town.

Problem 8: See [Sun Zi](#)

Suppose we have an unknown number of objects. When counted in threes, 2 are left over, when counted in fives, 3 are left over, and when counted in sevens, 2 are left over. How many objects are there?

Problem 9: See [Nine Chapters](#)

A cistern is filled through five canals. Open the first canal and the cistern fills in $\frac{1}{3}$ day; with the second, it fills in 1 day; with the third, in $2\frac{1}{2}$ days; with the fourth, in 3 days, and with the fifth in 5 days. If all the canals are opened, how long will it take to fill the cistern?

Problem 10: See [Li Zhi](#)

Given a circular walled city of unknown diameter with four gates, one at each of the four cardinal points. Two persons A and B start from the west gate. B walks a distance of 256 pu eastwards. Then A walks a distance of 480 pu south before he can see B. Find the diameter of the town.

Problem 11: See [Li Zhi](#)

Given a circular walled city of unknown diameter with four gates, one at each of the four cardinal points. Person A leaves the west gate and walks south for 480 pu. B leaves the east gate and walks straight ahead a distance of 16 pu, when he just sees A. Find the diameter of the town.

Problem 12: See [Li Zhi](#)

Given a circular walled city of unknown diameter with four gates, one at each of the four cardinal points. 135 pu directly out of the south gate is a tree. If one walks 15 pu out of the north gate and then turns east for a distance of 208 pu, the tree comes into sight. Find the diameter of the town.

Problem 13: See [Qin Jiushao](#)

Given a circular walled city of unknown diameter with four gates, one at each of the four cardinal points. A tree lies three li north of the northern gate. If one turns and walks eastwards for nine li immediately on leaving the southern gate, the tree just comes into view. Find the circumference and the diameter of the city wall.

Problem 14: See [Li Zhi](#)

A square farm has a circular pond in the centre. The land area is 13 mou and $7\frac{1}{2}$ tenths of a mou. The pond is 20 pu from the edge. Find the length of the side of the farm and the

diameter of the pond.

Problem 15: See [Cheng Dawei](#)

Now a pile of rice is against the wall with a base circumference 60 chi and an altitude of 12 chi. What is the volume? Another pile is at an inner corner, with a base circumference of 30 chi and an altitude of 12 chi. What is the volume? Another pile is at an outer corner, with base circumference of 90 chi and an altitude of 12 chi. What is the volume?

Problem 16: See [Cheng Dawei](#)

A small river cuts right across a circular field whose area is unknown. Given the diameter of the field and the breadth of the river find the area of the non-flooded part of the field.

Problem 17: See [Cheng Dawei](#)

In the right-angled triangle with sides of length a , b and c with $a > b > c$, we know that $a + b = 81$ ken and $a + c = 72$ ken. Find a , b , and c .

Problem 18: See [Zhu Shijie](#)

A right-angled triangle has area 30 bu. The sum of the base and height of the triangle is 17 bu. What is the sum of the base and hypotenuse?

Problem 19: See [Wang Xiaotong](#)

Let a right angled triangle have sides a , b , c where c is the hypotenuse. If a times b is seven hundred and six and one fiftieth, and if c is thirty six and nine tenths more than a . What are the values of the three sides.

Problem 20: See [Zhang Qiujian](#)

A circular road around a hill is 325 li long. Three persons A, B, and C run along the road. A runs 150 li per day, B runs 120 li per day, and C runs 90 li per day. If they start at the same time from the same place, after how many days will they meet again.

Problem 21: See [Zhang Qiujian](#)

There are three persons, A, B, and C each with a number of coins. A says "If I take $\frac{2}{3}$ of B's coins and $\frac{1}{3}$ of C's coins then I hold 100". B says "If I take $\frac{2}{3}$ of A's coins and $\frac{1}{2}$ of C's coins then I hold 100 coins". C says "If I take $\frac{2}{3}$ of A's coins and $\frac{2}{3}$ of B's coins, then I hold 100 coins". Tell me how many coins do A, B, and C hold?

Problem 22: See [Zhang Qiujian](#)

Cockerels costs 5 qian each, hens 3 qian each and three chickens cost 1 qian. If 100 fowls are bought for 100 qian, how many cockerels, hens and chickens are there?

Problem 23: See [Yang Hui](#)

100 coins buy Wenzhou oranges, green oranges, and golden oranges, 100 in total. If a

Wenzhou orange costs 7 coins, a green orange 3 coins, and 3 golden oranges cost 1 coin, how many oranges of the three kinds will be bought?

Problem 24: See [Yang Hui](#)

A number of pheasants and rabbits are placed together in the same cage. Thirty-five heads and ninety-four feet are counted. Find the number of pheasants and rabbits.

Problem 25: See [Zhu Shijie](#)

Given the relations $2yz = z^2 + xz$ and $2x + 4y + 4z = x(y^2 - z + x)$ between the sides of a right angled triangle x, y, z where z is the hypotenuse, find $d = 2x + 2y$.

Problem 26: See [Zhu Shijie](#)

If the cube law is applied to the rate of recruiting soldiers and it is found that on the first day 3 cubed are recruited, 4 cubed on the second day, and on each succeeding day the cube of a number one greater than the previous day are recruited, how many soldiers in total will have been recruited after 15 days? How many after n days?

Problem 27: See [Zhu Shijie](#)

Let d be the diameter of the circle inscribed in a right triangle (you should use the relation $d = x + y - z$ where x, y, z are as defined below). Let x, y be the lengths of the two legs and z the length of the hypotenuse of the triangle. Given that $dxy = 24$ and $x + z = 9$ find y .

Other Web sites:

[Astroseti](#) (A Spanish translation of this article)

Article by: *J J O'Connor and E F Robertson*

[History Topics Index](#)

[Chinese Mathematics](#)

[Main index](#)

[Biographies Index](#)

[Famous curves index](#)

[Birthplace Maps](#)

[Chronology](#)

[Time lines](#)

[Mathematicians of the day](#) [Anniversaries for the year](#)

[Search Form](#)

[Societies, honours, etc](#)

JOC/EFR December 2003

The URL of this page is:

http://www-history.mcs.st-andrews.ac.uk/HistTopics/Chinese_problems.html