MATH FOR KIDS
October 6, 2003

Common sense problems:

(1) In an arithmetic addition problem the digits were replaced with letters (equal digits by same letters, and different digits by different letters). The result is: `LOVES+LIVE=THERE`. How many "`LOVES`" are "`THERE`"? The answer is the maximum possible value of the word `THERE`.

(2) distribute 127 one dollar bills among 7 wallets so that any integer sum from 1 through 127 dollars can be paid without opening the wallet.

(3) Matches are arranged to form the figure shown in figure below. Move two matches to change this figure into four squares with sides equal in length to one match.

Pigeonhole principle:

(1) What is the largest number of kings which can be placed on a chessboard so that no two of them put each other in check?

(2) What is the largest number of spiders which can be amicable share the spider web pictured below? A spider will tolerate a neighbor only at a distance of 1.1 meter or more, traveling along the web.

(3) Show that an equilateral triangle cannot be covered completely by two smaller equilateral triangles.

(4) Fifty-one points are scattered inside a square with a side of 1 meter. Prove that some set of three of these points can be covered by a square with side 20 centimeters.

(5) Five young workers received as wages $ 1500 altogether. Each of them wants to buy a cassette player costing $ 320. Prove that at least one of them must wait for the next paycheck to make his purchase.

(6) In a brigade of 7 people, the sum of the ages of the members is 332 years. Prove that three members can be chosen so that the sum of their ages is no less than 142 years.

(7) On a certain planet in the solar system Tau Cetus, more than half the surface of the planet is dry land. Show that the Tau Cetans can dig a tunnel straight through the center of their planet, beginning and ending on dry land (assume that their technology is sufficiently developed).