

Huddle 2006

1. Suppose the grid is filled in so that every row, column, and 2×2 box in double lines contains each of the digits 1,2,3 and 4. Evaluate X .

	1		
2			
3		X	
			4

2. The number $30X0X03$, written in ordinary decimal notation, is a multiple of 13. What digit is X ?

3. Triangle ABC has area 1. Form a new triangle XYZ by constructing on each vertex of triangle ABC a line parallel to the opposite side. What is the area of triangle XYZ ?

4. Die A is 6-sided, and has the number 1 printed on 5 of its faces, and the number 2 printed on the remaining face. Die B is 4-sided, and has the number X printed on 3 of its faces, and Y on the remaining face. On both dice, each face is equally likely to come up.

When you roll the two dice, the probability is $1/3$ that the sum of the numbers that come up is 5. Evaluate X .