
IMO Number Grids Questions

Level: Intermediate Ref No: M05

Puzz Points: 13

Four football teams – the Apes, the Baboons, the Chimps and the Gorillas – play each other once in a season. After some of the matches have been played the table of results, with some entries missing, looks like this:

| Team | Played | Won | Lost | Drawn | Goals For | Goals Against |
|------|--------|-----|------|-------|-----------|---------------|
| A | | 0 | | 0 | 2 | 3 |
| B | | | | 0 | | 1 |
| C | 2 | | | | 4 | |
| G | | 0 | | 1 | | 5 |

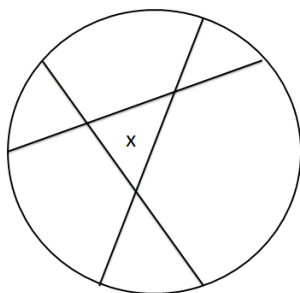
Complete the table, explaining how each entry is worked out, and find the score in each match played so far.

Level: Intermediate Ref No: M30

Puzz Points: 18

Three chords are drawn in a circle to create seven regions, as shown. The numbers 1 to 7 are to be placed, one in each region, so that, for each chord, the total of the numbers in the circle on one side of the chord is equal to the total of the numbers on the other side.

How many possible values are there for the number x in the central region?

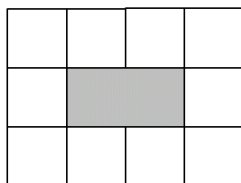


Level: Intermediate Ref No: M48

Puzz Points: 18

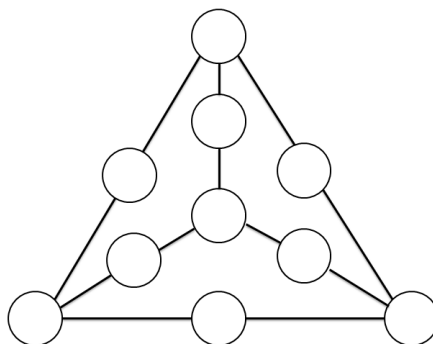
The numbers 1 to 10 are to be placed in the unshaded boxes, so that the two rows of four boxes and the two columns of three boxes all have the same total T .

- Find a solution when $T = 20$.
- Find the minimum possible value of T .



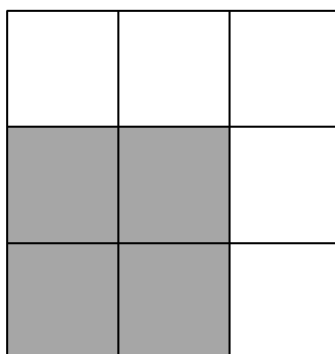
Sam wishes to place all the numbers from 1 to 10 in the circles, one to each circle, so that each line of three circles has the same total.

Prove that Sam’s task is impossible.



The numbers 1 to 9 are placed in the cells of a 3×3 square grid, one to each cell. In each of the four 2×2 blocks of adjacent cells, such as the one shaded, the four numbers have the same total T .

What is the maximum possible value of T ?



Teams A, B, C and D competed against each other once. The results table was as follows:

| Team | Win | Draw | Loss | Goals For | Goals Against |
|------|-----|------|------|-----------|---------------|
| A | 3 | 0 | 0 | 5 | 1 |
| B | 1 | 1 | 1 | 2 | 2 |
| C | 0 | 2 | 1 | 5 | 6 |
| D | 0 | 1 | 2 | 3 | 6 |

- Find (with proof) which team won in each of the six matches.
- Find (with proof) the scores in each of the six matches.