Indian National Mathematical Olympiad 2014

Revaluation

If you would like to apply for revaluation please make sure that we receive your performance card along with a demand draft latest by **5th of March, 2014**. Before applying for revaluation, please note the following things.

- The evaluation is much stricter than most of the normal school exams. Typically, there are no marks given for quoting a theorem (unless they are a crucial step).

- If you have written "clearly it follows ...", and a couple of (non-trivial) steps are required to see why it is so clear, then you would lose a few points (depending on how non-trivial those steps are).

- Correct answer without a correct explanation usually fetches you very little points. (See the scheme for problem 6 below.)

- Most importantly, all the top 140 scripts were rechecked for any mistakes in evaluation.

Marking scheme

A very rough marking scheme used is below. Note that for most of the problems, there are many ways to solve, and so an appropriate scheme equivalent to the below is used if a solution is very different from the model solution. Also, as typical in Olympiad exams, the marking scheme need not be additive: if part I carries x points and part II carries y points, then part I and II together need not carry $x + y$ points.

1. Typical partial marks are 2 and 4 points. Showing that the line joining the centroids is parallel to BC carries 2 points and showing that the cyclic quadrilateral in question is isosceles carries another two points.

   In case you do not use the triangle inequality to rule out one of the two cases then you lose 4 points.

2. There is no point given for just checking the results for the first few values of n. If you have noticed that $\left[\frac{n+1}{k}\right] - \left[\frac{n}{k}\right]$ is 0 or 1 then you get 3 points. Another 6 points for figuring out when the expression is 0 and when it is 1. Similarly, 3 points are given for noticing $\left[\sqrt{n+1}\right] - \left[\sqrt{n}\right]$ is 1 or 0 depending on whether $n+1$ is a square or not.

3. This is the problem with most partial scores. Just mentioning AM-GM (and not going any further) is given 1 point.

   If you have proved in inequality when $gcd(a, b) > 1$ or when $gcd(a, b) = 1$ then you get 4 points, and if you proved the inequality in both the cases then you get 10 points.

   If inequality is shown and only one case of equality is discussed then you get 13 points.

   If only the cases of equalities are mentioned without proof and no proof of the inequality, then you get 4 points (2 each of the two cases).

4. All correct solutions by the students to this problem follow the official solution (some in disguise). Many have considered more than three cases. If there is any of these cases that are not dealt properly then you would lose 2 or 3 points (per case).

5. If you have used coordinate geometry or trigonometry, and written "by simplifying the above equations the results follows" or such equivalent statement, and the simplification is not just a couple of simple steps, they you would get zero points.

   There are very rare partial credits in this problem (for showing cyclicity of certain points that eventually leads to a solution).

6. Most people who have answered this question have got either zero or two points. You get only two points for guessing the two equality cases. Starting with one of these two equality cases, and arguing that no extra element can be added to that collection fetches you no further points. Proving the first part carries 6 points.