

Math Questionnaire and Check-In

Los Angeles Math Circle | Advanced Group | 01.12.2014

- Have you taken the following math classes and/or subjects?
Write “YES” if you’ve completed the class, “IP” if you’re taking it this year, and “NO” if you haven’t.
ALSO, please rate yourself from 1-5 on a scale of how comfortable you are with the subject.
(1 = “I remember nothing”; 5 = “I got this”)
(This is just for the instructors to get a better picture of everyone’s background so we have an idea of what kinds of things to cover, and what we can assume most people will know. Just be honest; we aren’t evaluating you based on this!)

1. Pre-Algebra
2. Algebra I
3. Geometry
4. Algebra II
5. Complex numbers
6. Quadratic equations
7. Arithmetic and geometric series
8. Modular arithmetic
9. Constructions

The following problems are designed to see where the class stands. If you have no idea how to solve it, just say so. If you do know how, show us. (Please don’t copy from your neighbor... if you write down a solution, I’ll assume you really do understand the concept!)

1. Quadratic equations. Solve the following:

(a) $x^2 - x - 4 = 2$

(b) $2x^2 - 4x - 1 = 0$

2. Constructions.

(a) What materials are you allowed to use when making a construction?

(b) Show/explain how you would construct the perpendicular bisector of a given line segment. (I don't expect you to have the necessary materials, but a brief explanation or sketch is fine.)

3. Complex numbers.

(a) Simplify the product $i(2i)(-3i)$.

(b) What is the conjugate of $3 - 4i$?

4. Modular arithmetic. Could it be true, in some world, that $2 + 3 = 1$?