

12TH GRADE A LEVEL MATHEMATICS I SYLLABUS

Fall 2015, Instructor: Eva Pillossof

Office: OHL 307, Office hours: Every day, 4 pm – 6 pm in the 9th and 10th hour classroom

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IMPORTANT: I am only giving you my personal phone number so that you may reach me at any time, because of the high intensity of the course. I am in NO way giving you permission to distribute it to your other classmates who are not in this course (especially lower classmen and women). I trust that you will not call me any time between 11 pm and 6 am either. If you have concerns whether calling me at a certain time is convenient, better send a message first. In the case you abuse my trust in you, I will automatically block all of your numbers for the rest of the term.

Class hours:

12/1: Tuesdays, Wednesdays, and Fridays, 12:10 pm – 1:40 pm

12/2: Tuesdays, Thursdays, and Fridays, 2:00 pm – 3:30 pm

12/3: Mondays, Wednesdays, and Fridays, 8:10 am – 9:40 am

12/4: Mondays, Tuesdays, and Fridays, 10:00 am – 11:30 am

DESCRIPTION: This is the first part of a university application course of higher than the regular level and as such, it is designed to best prepare you for the entrance exams offered in various European institutions. Most of the material we cover will be an extended review of the material you have studied throughout your entire high school career up until now. The course is divided into two semesters and I will be your instructor for both of its parts. The course is intensive and as you know it is school policy to limit the students who attend it by restricting access to students who are failing the class, who are not showing the necessary interest and/or progress, or who have for any reason (be it valid) have missed a large portion of the course.

You are in this class both because you have expressed a desire to be here by declaring that you will take a university exam in mathematics and because the school, your teachers, and your parents believe you are fully capable of handling the work load and do well on the exams. Throughout the duration of this course you will be treated as adults rather than as students, which means that I will not check if you have the necessary materials every time or deduct points for tardiness or ask you or monitor your overall behavior, because it is in your interest that you take the most you can from this course.

It is my responsibility to make sure you outperform yourselves and it is a responsibility I take very seriously. I will push you to your limits and beyond them with whatever intellectual instruments are at my disposal. The success rate of students in this course is over 95% on various mathematics exams throughout European higher education institutions. I am certain your class will be my first class of 100%. Now let's do this! Together!

ORGANIZATION: The first semester focuses entirely on algebra and the second – on geometry. New material will be taught on the first class of the week and the other two classes will be used only for problem solving. You will be assigned homework after every class, which will be due at the beginning of the class to follow. Expect to solve over 5, 000 problems on your own in this upcoming semester. Each non-lecture class will start with a quiz where each of you will have an individual problem to solve. Upon the completion of the quizzes we will discuss them together. You will have a test each week in 9th and 10th hour. The tests will be problems taken from real exams given at the universities and colleges where you plan to apply. Tests will be held as close as possible to the conditions in which they are administered. Your final exam will be your actual exam.

COURSE TOPICS: The topics covered in the first semester of this course are:

1. Algebra
 - a. Equations and inequalities
 - b. Powers and logarithms
 - c. Matrices
 - d. Functions
 - e. Limits
 - f. Functional analysis
 - g. Graphing methods
 - h. Derivatives
2. Statistics
 - a. Working with large data sets
 - b. Average, median, mode
 - c. Standard deviation
 - d. Statistical analysis
3. Trigonometry
 - a. Trigonometric functions
 - b. Trigonometric equations
 - c. Functional analysis

MATERIALS AND SUPPLIES: All of you are required to have the following materials for this class:

- Several hard cover A4 spiral notebooks of at least 200-250 sheets of lined paper (you may use a binder);
- Automatic pencil with 2B lead (0.5 or 0.7, whichever is more comfortable for you);
- Eraser;
- At least 5 different colored pens, fine liners, or pencils (I would recommend fine liners);
- Persistence and motivation!
- **YOU WILL NOT USE CALCULATORS IN THIS CLASS, BECAUSE YOU ARE MUCH SMARTER THAN THEM!**

EXPECTATIONS:

The only real expectation of this course is that you do excellent on your university entrance exams. I advise you to take detailed notes during class. I advise you to have all materials listed above at every class, including all lecture notes, because I will

often reference them. I advise you to learn to write in pencil, because you will do so on your exams and it is good practice. You are expected to demonstrate self-initiative and motivation. This is not a class where you will get points off for forgetting to bring your notebook. Ultimately everything you do here is for you and you alone. I expect you to have had realized that prior to entering my classroom for the first time and to give 120%. I expect hard work and dedication. I will never compromise with the quality of teaching you and I expect you not to compromise in your efforts to do well.

BEHAVIOR, TARDIES AND ATTENDANCE:

You are adults and you will be treated as such. If disturbing the class becomes a habit of yours, you will simply cease to attend it instantly. It is school policy to refuse access to this class to any student with more than two unexcused absences for the semester. Being late for a class on which you rely for your future is quite possibly the most disrespectful thing you can do to yourself. I will not tolerate it either, so if you are late for class, please do not come in.

9TH & 10TH HOUR:

By choosing to be in this class each of you has automatically agreed to attend 9th and 10th hour at least once a week. These hours are set for you to take your practice exams. If you so choose, you may attend those every day to get extra help or to work in a suitable environment. You are of course most welcome to attend each and every of my office hours as well.

GRADING SYSTEM: You will be graded according to the school's policy:

- 92.5% -- 100% - A (6);
- 81.5% -- 92.4% - B (5);
- 71.5% -- 81.4% - C (4);
- 61.5% -- 71.4% - D (3);
- 0.00% -- 61.4 - F (2).

GRADING PLAN: Coursework will be weighed as follows:

- In-class quizzes: 20%;
- HW assignments: 15%;
- Tests: 40%;
- Final exam: 25%;

You will not have any make-up exam or quiz sessions. Do not expect bonus questions or drawing projects either. I will not do curves on any assignment. **YOU WILL NOT GET PARTIAL CREDIT FOR PROBLEM SOLUTIONS. YOU EITHER SOLVED THE PROBLEM CORRECTLY OR YOU DID NOT. THERE IS NO MIDDLE GROUND!** IF YOU SOLVE A PROBLEM IN A MANNER THAT I HAVE NOT PREVIOUSLY SEEN, YOU WILL AUTOMATICALLY GET ONE GRADE HIGHER ON THAT ASSIGNMENT!

ACADEMIC INTEGRITY AND HONESTY: All academic integrity/honesty expectations and policies will be strictly enforced. Any plagiarizing, copying, or cheating on any assignment will automatically exclude you from this course. If you are the one voluntarily allowing your materials to be copied off of, both you and the person who copied your materials will be excluded from the class.

LATE POLICY AND ABSENCES: Late assignments will only be accepted in case of excused absences and **UNDER NO OTHER CIRCUMSTANCES!**

CLASS SCHEDULE: This is tentative schedule for this semester, divided by week. Please keep in mind that it is subject to change.

1. Number sequences; arithmetic and geometric progressions; simple and compound interest rates
2. Permutations, variations, and combinations; probability
3. Graphic data representation; histograms; average, median, and mode; standard deviation
4. Statistical tests; hypothesis formulation and testing
5. Linear equations with one variable; binomial theorem; formulae for short solutions; proportionalities
6. Quadratic and biquadratic equations; quadratic function, minimum and maximum; quadratic inequalities; Vieta's formulae
7. Equations and inequalities of higher powers; rational equations and inequalities; excluded values
8. Exponents and logarithms; exponential and logarithmic equations and inequalities
9. Radicals; radicals as exponents; irrational equations and inequalities
10. Parametric and modular equation and inequalities
11. Trigonometric functions; odd, even and periodic trigonometric functions; formulae for trigonometric functions
12. Law of sines; law of cosines; trigonometric equations and inequalities
13. Limits; functional analysis; graphic methods for solving equations and inequalities
14. Systems of equations and inequalities of first and second degree
15. Matrices; solving systems of equations
16. Derivatives; first derivative
17. Chain rule
- 18. Preparation for finals**
- 19. FINALS WEEK**