NWCS Summer Math Olympic (AMC 8) Training Class

Time: 9:00 am to 12:00 pm Weekday (M, T, W, Th, F)

Number of Sessions: 10 (6/17 – 6/28)

Purpose

We intend to provide a training opportunity to students who want to get ready for a national math competition, i.e., AMC 8 - AMC 8 | Mathematical Association of America (maa.org).

The program takes 10 days. Training material will be within the scope of AMC 8.

- Short-term Goal:
  Help students to improve their performance (scoring) in AMC 8.

- Long-term Goal:
  Help students who have great passion to learn fundamental math concepts and are eager to expose themselves to a challenging problem-solving world at the level of elementary to middle school.

Students:

Students who have previously taken MO1 (Math competition for beginners from NWCS) or equivalent knowledge. The most important thing is a student's curiosity and passion to learn.

Course Plan

Day 1 – Number Sense and Number Theory

Day 2 – Fraction, Ratio and Proportion

Day 3 – Basic Geometry

Day 4 – Basic Algebra

Day 5 – Interim Review and Practice

Day 6 – Counting and Number Series

Day 7 – Probability and others

Day 8 – Comprehensive

Day 9 – Potpourri

Day 10 – AMC 8 test simulation & award

Every day we follow basic teaching principle:

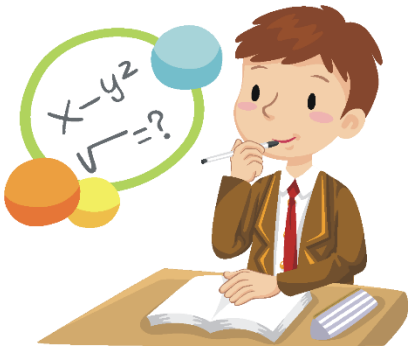
- Give students previews of what they expect to learn for the day, in order to warm up the class session.
- Teach students step by step using the simplest language and have the students practice when they learn.
- Emphasize again what the teacher has taught for the day and give students more challenges as needed.

Detailed sequence:

1st hour - Introduce basic concepts, explain in-depth techniques in specific areas.

2nd hour - Provide students with hands-on opportunity, teacher gives guidance and helps students diagnose their mistakes to improve learning results.

3rd hour - Reiterate fundamental concepts from different perspectives, summarize what has been taught.



NWCS Summer Algebra for Middle School

Time: 10:00 am-12:00 pm Monday and Thursday.
Number of Session: 8 (7/1, 7/8, 7/11, 7/15, 7/18, 7/22, 7/25, 7/29)

Summer Algebra for Middle School is designed to help students to review and deepen the understanding of middle school Algebra. It targets the students who finished the Enrichment 4-Algebra class and/or who have the basic knowledge of Algebra. The class size will be limited to 12 students with the intention of creating more opportunity for classroom discussion and teacher-student interaction.

The purpose of the class is three folded:
1) provide a thorough review of the most important Algebra concepts learned in the past one year.
2) challenge the student with more advanced algebraic problems.
3) enhance problem-solving skills by intensive in-class exercise and group discussion.

Organization

The 2-hour class will be typically ordered in the following way.

- Quiz (5-10 minutes)
- Discuss the homework and quiz (15- 20 minutes)
- New lecture (50- 60 minutes)
- Classroom exercise and group discussion (30-40 minutes)

Textbook:

The class teaching material is based on the "New Elementary Mathematics 2" by Singapore Math - ***http://www.singaporemath.com/New_Elem_Math_Textbk_2_p/nemt2.htm.***
This is the same book used for the Enrichment Math 4- Algebra. Additional study material will be provided by the teacher.

Sessions

This 4-week course will cover the following topics:

Session 1: One-variable linear equation and its application to solve real problem.

Session 2: Algebraic operation, Algebra manipulation - expanding and factorization.

Session 3: Exponents and Indices

Session 4: One-variable quadratic equation and its application to solve real problem.

Session 5: Rate, Ratio, Percentage, and their application in financial transaction

Session 6: System of equations and its application

Session 7. The X-Y coordinate plan; Linear and quadratic equation in graph

Session 8: Solving inequity.

NWCS Summer Geometry for Middle School

Time: 7:00 p.m. - 9:00 p.m. Wednesday & 10:00 a.m. - 12:00 p.m. Saturday.

Number of Sessions: 8 (7/3, 7/6, 7/10, 7/13, 7/17, 7/20, 7/24, 7/31)

Summer Geometry for Middle School is designed to help students to review and deepen the understanding of middle school Geometry. It targets the students who already have the basic knowledge of Geometry. The class size will be limited to 12 students with the intention of creating more opportunity for classroom discussion and teacher-student interaction.

The purpose of the class is three folded:
1) provide a thorough review of the most important Geometry concepts
2) challenge the student with more advanced problems.
3) enhance problem-solving skill by intensive in-class exercise and group discussion.

Organization

The 2-hour class will be typically ordered in the following way.

- Discuss the homework (20 minutes)
- New lecture (80 minutes)
- In class practice/group project/quiz (20minutes)

Textbook:

The class teaching material is partially based on the "New Elementary Mathematics 2" by Singapore Math - ***http://www.singaporemath.com/New_Elem_Math_Textbk_2_p/nemt2.htm***.
Additional study material will be provided by the teacher.

Session

This 4-week course will cover the following topics:

Session 1: Basic of geometry

Session 2: Congruent Triangles

Session 3: Similar Triangles

Session 4: Quadrilaterals/Polygons

Session 5: Solid Figures

Session 6: Right Triangle and trigonometry

Session 7: Motion Geometry

Session 8: Circles

NWCS Summer Algebra 2 for Middle School

Time: 7:00 p.m. - 9:00 p.m. Wednesday & 10:00 a.m. - 12:00 p.m. Saturday.

Number of Sessions: 8 (8/3, 8/7, 8/10, 8/14, 8/17, 8/21, 8/24, 8/28)

Summer Algebra II builds on the skills and concepts you learned in Algebra I. One of the key concepts is the idea of functions: functions are fundamental building blocks for the development of higher mathematics. It targets the students who finished Enrichment 4-Algebra. It is more advanced, and it prepares students for high school.
This class is:
1) designed to help students review, improve, and build stronger math foundations.
2) challenge the student with more advanced problems beyond Algebra.
3) enhance problem-solving skills by intensive in-class exercise and group discussion.

Organization

The 2-hour class will be typically ordered in the following way.

- Quiz (5-10 minutes)
- Discuss the homework and quiz (15- 20 minutes)
- New lecture (50- 60 minutes)
- Classroom exercise and group discussion (30-40 minutes)

Textbook:

The class teaching material is based on “Algebra II" by McGraw Hill.
A screenshot of the cover page of the textbook is attached.

Sessions

This 4-week course will cover the following topics:

Session 1: Linear equation and inequalities

Session 2: Quadratic relationships

Session 3: Complex numbers

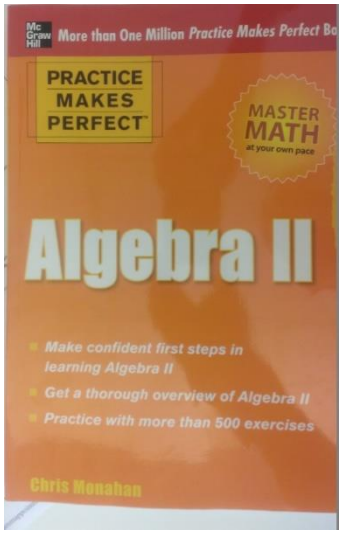
Session 4: Polynomial functions

Session 5: Relational and irrational functions

Session 6: Exponential and logarithmic functions

Session 7. Sequences and series

Session 8: Introduction to probability



NWCS Summer Programming Course
Python Intermediate level

Time: 10:00 a.m. – 12:00 p.m. Saturday and 18:30 p.m. – 20:30 p.m. Wednesday
Number of Sessions: 8 (6/15, 6/19, 6/22, 6/26, 6/29, 7/3, 7/6, 7/10)

Overview:

The purpose of this course is to introduce the basic concepts and tools for Python programming and apply Python (version 3.x) and Jupyter Notebook tool to basic data analysis projects. Students need to have basic programming knowledge (i.e., Java basic, etc.) to be qualified to take this course.

Structure:

Each 2-hour class session will be organized in the following format:

1. Warm-up/Homework Review (20 minutes)
2. Quiz (10 minutes)
3. Lesson Part 1 (30 minutes)
4. Break (10 minutes)
5. Lesson Part 2 (30 minutes)
6. Hands on Practice (20 minutes)

Topics:

This course will cover, but are not limited to, the following topics:

1. Fundamental tool set for Python development and its library support.
2. Data type, Input / Output and Logic Control
3. Data Collection, Processing, and analysis
4. Basic Algorithms and Data Structures
5. Text data processing and introduction of basic NLP
6. Modeling 101 with Python
7. Hands on project experience
8. Hands on project experience & Final review