

## CTYOnline MATHCOUNTS® Course Syllabus

### INTRODUCTION

The goal of this course is to familiarize students with MATHCOUNTS competition problems and to assist them in applying efficient problem solving strategies while tackling any level problem. This will be done by exposing students to a wide array of MATHCOUNTS competition questions and involving students in interactive group sessions with the course instructor, whereby students will be introduced to competitive math problem solving strategies. The course will focus on 11 topics that consistently appear in MATHCOUNTS competitions, including:

- 1- Fundamentals: Arithmetic
- 2- Proportional Reasoning
- 3 - Radicals and Exponents
- 4 - Algebra A: Polynomials, Linear Equations and Functions
- 5 - Algebra B: Applications, Nonlinear Equations, Inequalities, Functions.
- 6 - Plane Geometry
- 7 - Coordinate Geometry
- 8 - Solid Geometry (addresses also transformational geometry)
- 9 - Statistics and Probability
- 10 - Sequences and Series
- 11 - Problem Solving

### COURSE OBJECTIVES

- 1 - Expose students to the mathematical concepts required for solving MATHCOUNTS competition questions.
- 2 - Teach students problem solving strategies, such as using formulas, drawing sketches, writing equations, using tables, charts, organized lists and tree

diagrams, working backwards, simplifying the problem, finding patterns and using elimination.

3 - Familiarize student with the structure and types of questions used in MATHCOUNTS competitions.

## **COURSE RESOURCES**

### Reference Notes:

Each of the 11 topics has a list of defined vocabulary and formulas required for mastering questions that pertain to that topic. These lists should be used as references by students when tackling each of the topics. Thorough review of these lists is required before each group session.

### Group Sessions:

Each week, students are required to attend one 1-hour interactive whiteboard session with the instructor. During these sessions, the instructor will review key topic concepts and expose students to various time saving problem solving approaches.

### Exercises:

Students are required to complete a set of exercises that have been divided into assignment sets for each topic. These exercises will prepare students to tackle Chapter, State, and National level MATHCOUNTS Competition questions.

### Team Questions:

Each week a team question will be posted in the discussion area. Students will collaborate with one another to solve the problem. Team questions will prepare students to tackle the Team Round questions on MATHCOUNTS Competitions. The discussion board provides an opportunity for students to discuss problem solving strategies and experience a collaborative approach to solving a question.

### Instructor:

As an experienced MATHCOUNTS coach, your instructor will be a valuable resource. Teaching efficient and time saving strategies to solve problems, is the instructors number one priority. In addition to tracking a students progress in the course, the instructor will answer questions emailed or posted by students. Students should make use of the 'Send a note to instructor' feature available on the course website, to receive additional support from the instructor.

## **COURSE REQUIREMENTS**

**Group Sessions:** Students are required to attend one 1-hr whiteboard group session each week. In each weekly whiteboard session, the week's topic will be addressed by the instructor.

**Exercises:** Each week students are required to complete Problem Set A (25 questions) for the topic being covered that week. Although Problem Set B (25 questions) is not required, it is also highly recommended that students attempt the questions in Problem Set B.

**Quizzes:** At the end of each week after completing the problem set(s) students are required to take QUIZ A (10 questions, not timed). To further enhance competitive math skills, students are also encouraged to take QUIZ B (10 questions, TIMED).

**Final Competition:** After cycling through all 11 topics and completing the respective exercises and quizzes, students will be ready to tackle the Final Competition. This exercise is a final assessment of problem solving skills, and students will use the strategies and tricks learned throughout this course to perform the Final assessment.