

# Mathematics Achievement Awards

## 1. Bronze Medal of Achievement

This standard is measured based on the online learning system Alcumus.

### Introduction

The Alcumus system helps students to improve their problem solving skills based on the feedback received when attempting each problem, as well as through the video lessons available on the website. The problems are organized by subject (Prealgebra, Algebra, Number theory, Counting & Probability and Geometry). Each subject comprises a number of topics. Students can track their performance by subject and topic.

### Proposed Standard for Bronze Medal:



To Achieve the Bronze Medal, student must **Master at least 10 topics** in each of the following subjects: Algebra, Number Theory, Counting & Probability, Geometry (40 topics altogether).

### Student Instructions:

1. On the Art of Problem Solving website <http://www.artofproblemsolving.com/> Click on the top right corner to Register.
2. Once registered, click on the top right corner to Login. Then select **Alcumus** from the Menu Bar.
3. Read the **Help** section before starting. Then use **Settings** to select your desired level of difficulty. You can adjust the level at any time. This determines how fast you achieve a passing standard.
4. Enrol in our Algebra class at the following link:

<http://schola.aops.com/205/FPQJ>

As you progress with your algebra work, you will be automatically enrolled in our other classes.

5. **Get Problem**. Note: the system will automatically assign you some topics. In order to choose your own focus topic, click the Pencil  (edit button) on the **Focus Topic** display on the **Get Problem** page. You can only choose one topic at a time.
6. Each passed topic is signalled by a **green bar** in the **Focus Topic** display area of your **Get Problem** page. Once you pass it the system automatically moves to the next topic in the list. To master a passed topic, you first need to manually reselect it as your focus topic using . Each mastered topic is signalled by a **blue bar**. You may also follow your overall progress in the **Report** page. Click on each subject area to see the topics in that subject.

### Certificates

Once you have achieved the required standard highlighted above, email [a.mustata@ucc.ie](mailto:a.mustata@ucc.ie) and provide **your name, contact details and school address**. Then the centre organizers will be able to certify your standard and provide you with a diploma.

## Silver Medal of Achievement

Students who have earned their Bronze Medal of Achievement Award may continue towards the Silver standard.

### Introduction

The silver standard is also measured based on the online learning system Alcumus, and it involves mastering further topics in each of the main areas: Algebra, Number Theory, Counting & Probability, Geometry.

### Proposed Standard for Silver Medal:

To Achieve the Silver Medal, student must **Master at least 20 topics** in each of the following subjects: Algebra, Number Theory, Counting & Probability, Geometry.

### Certificates

Once you have achieved the required standard highlighted above, email [a.mustata@ucc.ie](mailto:a.mustata@ucc.ie) and provide **your name, contact details and school address**. Then the centre organizers will be able to certify your standard and provide you with a diploma.

## Gold Medal of Achievement

Students who have earned their Silver Medal of Achievement Award may attempt achieving the Gold standard. This standard is measured based on the online competition Purple Comet.

### Introduction

One of the most important skills of a mathematician is the ability to explain logically each step in the solution of a problem. Thus the present challenge is to write complete solutions – not just answers – to a set of problems, with clearly stated steps and proofs of any assertions made in the solution. The Purple Comet website allows students to access problem given in past competitions, as well as their numerical answers. Thus students can check themselves whether their own methods of solving the problem leads to the correct answer. Once this is achieved, there remains the task of solution write-up.

### Proposed Standard for Gold Medal:

To Achieve the Gold Medal, students must provide complete written solutions for all the problems in one of the past Purple Comet contests at High-School level. The achievement of the golden standard will depend on the correctness of the solutions and the clarity of your mathematical presentation.

### Student Instructions:

1. Access the Purple Comet old contests with answers here:  
<http://purplecomet.org/welcome/practice>
2. Once you have checked your answers, send your written solutions to [a.mustata@ucc.ie](mailto:a.mustata@ucc.ie) together with your Name, School address and contact details (e-mail address). Then the centre organizers will review your solutions. If improvement is needed, they will send you written feedback. Otherwise your school will receive by mail your certificate and medal of achievement.