

# 2018 Olympiads School Math Tournament



## Contest Overview

The **2018 Olympiads School Math Tournament (OSMT)** is designed to provide high school students the opportunity to develop their mathematical skills in a fun and challenging competition. The OSMT will be held at **Olympiads School** (306 Consumers Road; North York, ON; M2J 1P8), on **Saturday, April 14, 2018**.

The OSMT is a high school tournament, but younger students who have advanced knowledge in mathematics are encouraged to participate as well. There will be 2 divisions: junior and senior. Each division will have different problems.

Individuals who are grade 10 or younger are qualified to take the junior individuals test. All members of a team must be grade 10 or younger in order for the team to take the junior team test. There will be both individual and team prizes for both divisions.

## Registration Information

Students who wish to participate should form **teams of 4 or less** and register together. Incomplete teams will be randomly matched with other teams of the same grade. The registration to OSMT is open on <http://tiny.cc/OSMT2018> until **April 7, 2018 at 9 pm**. The registration fee is **\$60 per team of four people (\$15 per person)**. This fee is used to cover 3 rounds of competition, awards to top scorers, as well as food and refreshments. Cheques must be made out to **Olympiads School** and brought to the registration desk the day of the tournament.

## Food

Lunch and refreshments will be served during this tournament. Student with dietary restrictions should report so on the registration form.



## Contest Format

Each team participating in the OSMT will compete in 3 rounds of competition. Select solutions will be presented afterwards in an optional session.

### Team Round

- Time: **45 Minutes**
- Number of Problems: **4**
- Problem Format: **Full Solution**
- Problem Weights: **10 Points per Problem**
  
- Remarks: A detailed solution writing guide will be provided to all teams. Correct solutions, if poorly written, may not earn full marks.

### Individual Round

- Number of Sets: **4 Sets**
- Time: **20 Minutes per Set (80 Minutes Total)**
- Number of Problems: **5 per Set (20 Problems Total)**
- Problem Format: **Answer Only**
- Problem Weights: **1 Point per Problem**

### Lightning Round

- Time: **45 Minutes**
- Number of Problems: **30**
- Problem Format: **Answer Only**
- Problem Weights: **1 Point per First 20 Problems, 2 Points per Last 10 Problems**
  
- Remarks: Later problems can only be accessed after answers to previous problems are submitted. Teams cannot change their answers after submission. The score of all teams will be displayed live.

### Presentation of Solutions (Optional)

- Time: **45 Minutes**
  
- Remarks: OSMT problem setters, including 2 IMO medalists (1 gold medalist and 1 silver medalist), will present the solutions to and motivations behind OSMT problems. This session is highly recommended for participants who wish to improve their skills through this event.

## Timetable

Time	Event
9:30 am - 10:00 am	Registration
10:00 am - 10:15 am	Introduction and Briefing
10:15 am - 11:00 am	Round 1: Team Round
11:00 am - 11:15 am	Break
11:15 am - 12:45 pm	Round 2: Individual Round
12:45 pm - 1:30 pm	Lunch
1:30 pm - 2:15 pm	Round 3: Lightning Round
2:15 pm - 3:00 pm	Presentation of Selected Solutions
3:00 pm - 3:30 pm	Awards Ceremony



## Why Participate?

- Improve your math skills and practice for contests such as Euclid, COMC or AMC
- Attend a lecture session taught by 2 IMO medalists.
- It will be fun!

## Sample Problems

1. The number 2559999 has lots of prime factors. Find the largest one.
2. Find the positive integer value of  $x$  such that  $x^2 - 171$  is equal to the sum of the first  $x$  positive integers.
3. Qinyu and Edgar are working together on a math contest with 8 questions. Each person must be working on at least one question. How many ways can they split the questions amongst themselves so that there is at least one person (or perhaps both of them) working on each question?
4. William is playing a game on the following grid. Every minute, William records the letter he is currently standing on, and then he moves to an adjacent (up, down, left, or right) cell. After five minutes, he notices he has written the letters RADAR in his notebook, in that order. How many paths could he have taken? (Two paths are the same if and only if they contain the same cells, and the cells were traversed in the same order).

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      R
    R A R
  R A D A R
R A D A D A R
R A D A R A D A R
  R A D A D A R
    R A D A R
      R A R
        R
  
```

5. How many possible remainders are there when a perfect cube is divided by 101?