



21st Philippine Mathematical Olympiad



28 August 2018

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SEP 12 2018
DEPED DIVISION OF BAGUIO CITY

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May B. Eclar, Ph.D., CESO V
Officer-in-Charge
Office of the Regional Director
Department of Education – CAR
Wangal, La Trinidad, Benguet

*to: Mr Francis
K. Inf and bu...
In or to: [Signature]*

RECEIVED
SEP 18 2018
DEPED-CAR

Dear Director Eclar:


Greetings!

The Mathematical Society of the Philippines will once again conduct the **Philippine Mathematical Olympiad (PMO)** this year. PMO is the oldest and most prestigious nationwide mathematics competition among high school students. It is designed to select the best high school students in mathematical problem-solving through a friendly competition.


The PMO aims to: stimulate the improvement of mathematics education in the country by awakening greater interest in and appreciation of mathematics among students and teachers, and gaining insights into the levels of mathematics learning; identify and motivate the mathematically gifted; identify potential participants to the International Mathematical Olympiad; provide a vehicle for the professional growth of teachers; and encourage involvement of public and private sectors in the concerted promotion and development of mathematics education.

The **21st PMO** shall be carried out in three stages:

1. Qualifying Stage **20 October 2018 (Sat), 1:00 pm – 4:00 pm**: The Qualifying Stage is a multiple choice type of exam which will be administered at the **University of the Philippines Baguio (UPB)**.
2. Area Stage **24 November 2018 (Sat), 1:00pm**: The Area Stage is a written competition among students in each area who will qualify based on their performance in the Qualifying Stage. It will be conducted at **UPB**.
3. National Stage **26 January 2019 (Sat)**, The National Stage is a written and oral competition among the winners of the Area Stage competition. This will be held at **Metro Manila**.



Republic of the Philippines
DEPARTMENT OF EDUCATION
CORDILLERA ADMINISTRATIVE REGION
Wangal, La Trinidad, Benguet



September 06, 2018

ADVISORY

To: Schools Division Superintendents
All Divisions

Interested participants can go at their own expense and on official time subject to EO 9, s.2005.

Information and dissemination.

[Signature]
MAY B. ECLAR, PhD, CESO V
Regional Director

To: All School Administrators, Principals & Teachers in Charge
(Elementary & Secondary)

FOR YOUR INFORMATION & APPROPRIATE ACTION

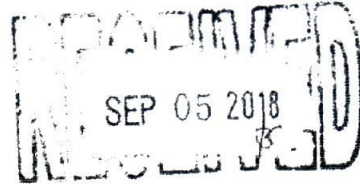
[Signature]
FEDERICO P. MARTIN, Ed.D, CESO VI
Schools Division Superintendent



21st Philippine Mathematical Olympiad



28 August 2018



DEPED-CAR

May B. Eclar, Ph.D., CESO V
Officer-in-Charge
Office of the Regional Director
Department of Education – CAR
Wangal, La Trinidad, Benguet

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3. **National Stage 26 January 2019 (Sat)**, The National Stage is a written and oral competition among the winners of the Area Stage competition. This will be held at **Metro Manila**.

Each school can send as many as **thirty (30) deserving students** (regardless of year level, **Grade 7 - 12**). To participate, each student needs to fill out an application form (see attachment). For those residing at CAR or Region I, application forms and a registration fee of **P150/student** may be sent personally or through courier **not later than October 12, 2018 (Friday, 5pm) to the following address:**


Department of Mathematics and Computer Science
College of Science
University of the Philippines Baguio
c/o Dr. Jerico B. Bacani
Governor Pack Road, Baguio City
Telefax: (074)442-3888, (074)442-7231

The school may also send the **confirmed number of participants** to **0929-488-7455** or to jicderivative@yahoo.com.

In line with this, we humbly ask for endorsement from your good office. We also humbly ask to disseminate the information to all your division's schools (public or private) once endorsed.


We look forward to your positive response regarding our request. Thank you for your usual support.

Respectfully yours,



Jerico Bacani, Dr.rer.nat.
PMO/Regional Coordinator, CAR-Region 1

Noted by:



Ma. Nerissa Masangkay Abara, Ph.D.
Director, Philippine Mathematical Olympiad



Emmanuel A. Cabral, Ph.D.
President, Mathematical Society of the Philippines



PHILIPPINE MATHEMATICAL OLYMPIAD

INSTRUCTIONS TO PARTICIPANTS (COMING FROM CAR AND REGION I)

1. Send your application form to UP Baguio (c/o Dr. Jerico B. Bacani, PMO Coordinator), together with the application fee of Php150.00, not later than October 12, 2018 (Friday, 5pm). For those who wish to submit the forms via email, payment may be done on October 20.
2. Registration on October 20 starts at 12:00 noon. Please come early. The qualifying exam starts at 1:00 pm.
3. You are encouraged to wear your school uniform during the exam.
4. Bring your school ID for validation purposes.
5. Examinee Numbers will be given during registration. Memorize your examinee number as this will serve as your identification.
6. Bring good quality pencils, rubber eraser, sharpener, and snacks.
7. The use of cellphones, calculators, and cameras is strictly prohibited during the exam.
8. The test will last for 3 hours.

INSTRUCTIONS TO COACHES / STUDENT REPRESENTATIVES

1. One school can only have a **maximum of 30 participants**. Coaches in the same school must coordinate with each other to avoid sending more than 30 students.
2. Submission of application forms or confirmation of number of participants must be done on or before October 12, 2018 (Friday, 5:00 pm). Payment of application fee can be done until October 20, 2018.
3. Registration on October 20 starts at 12:00 noon. Contest proper starts at 1:00 pm.
4. For further queries, email Dr. Bacani at jjcderivative@yahoo.com or call/text him through 09294887455.



PHILIPPINE MATHEMATICAL OLYMPIAD

APPLICATION FORM

CONTESTANT'S INFORMATION

Last Name			
First Name			
Middle Name	Suffix		
Year Level	Birthday		
Contact No.*	Sex		
E-mail Add.*			

Brought to you by:



SCHOOL INFORMATION

Name			
Address			
Tel. No.			
Principal			

COACH'S INFORMATION

Name			
Contact No.*			
E-mail Add.*			

In partnership with:



Tel. Nos.
(632) 928 0439
(632) 927 2686

Telefax
(632) 920 1009

**Important Note: Please provide contact number and email address of student and coach (if available) as contest reminders and details will be disseminated via SMS and e-mail.*

Other Reminders

1. For CAR and Region I participants, application forms must be submitted in UP Baguio (c/o Dr. Jerico B. Bacani) on or before **October 12, 2018 (Friday, 5pm)**. If physical submission is not possible, you may submit **clear scanned copies** of the forms through jicderivative@yahoo.com.
2. A registration fee of **Php 150.00** per participant will be charged upon submission of the application form.
3. Please visit the official PMO website, <https://pmo.ph>, and Facebook page, <https://www.facebook.com/PhilippineMathematicaOlympiad>, for updates and other announcements.

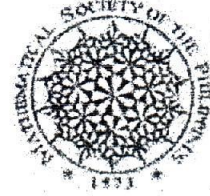
This part is to be filled in by the School Principal or Registrar.

The applicant's Final Grade in Mathematics for the School Year 2017-2018 was

School Principal
(signature over printed name)



21st Philippine Mathematical Olympiad



28 August 2018

High School Principals and Math Coaches
CAR-Region I

Dear Sir/Madame,

The Mathematical Society of the Philippines (MSP) invites your school to send at most **thirty (30)** of your best students (Grades 7 – 12) to participate in the **21st Philippine Mathematical Olympiad (PMO)** – the country's oldest and most prestigious nation-wide math competition among secondary school students.

The 21st PMO is designed to select the country's best students in mathematical problem-solving. It is done through three levels of competition beginning from the qualifying stage, to the area stage (Luzon, Visayas, Mindanao and NCR) and moving on to the national stage. For more information, please see attached brochure or visit the website pmo.ph. DepEd memo is also attached in this letter.

To participate, kindly ask each student to fill out a copy of the attached application form. You may send scanned copies of signed forms, or confirm the **number of participants**, to **09294887455** or to jjcderivative@yahoo.com on or before **5:00pm of October 12, 2018 (Friday)**. You may send also the accomplished forms to the following address:


Jerico B. Bacani, Dr.rer.nat.
PMO Regional Coordinator, CAR-Region I
University of the Philippines Baguio
Governor Pack Road, Baguio City


The qualifying stage of the PMO for CAR and Region I participants will be held on **October 20, 2018, Saturday, 1:00 pm** at **UP Baguio**. Please note that participating fee is **Php150.00** per student.

Thank you very much.

Respectfully yours,


Jerico Bacani, Dr.rer.nat.
PMO Regional Coordinator, CAR-Region I


Ma. Nerissa Masangkay Abara, Ph.D.
Director, PMO


Emmanuel A. Cabral, Ph.D.
President, Mathematical Society of the Philippines

Regional Coordinators

Region 1 & CAR JERICO B. BACANI

University of the Philippines Baguio
Governor Pack Road, Baguio City 2600
Tel. No.: (074) 442 3888 (074) 442 7231
Mobile: 0929 488 7455
Email: jicderivaive@yahoo.com

Region 2 CRIZALDY P. BINARAO

Cagayan State University
Tuguegarao City 3500
Tel. No: (078) 304 0802
Mobile: 0920 981 8036 / 0917 877 8122
Email: cpb_csu@yahoo.com

Region 3 EDUARD C. TAGANAP

Central Luzon State University
Munoz City, Nueva Ecija 3120
Mobile: 0922 717 9976
Email: eduardtaganap@gmail.com

Region 4A SHARON P. LUBAG

De La Salle University - Dasmariñas
DBB-B, Dasmariñas, Cavite 4115
Tel. No.: (046) 481 1800 to 1830 loc 3087
Mobile No: 0917 849 9703
Email: splubag@dlsud.edu.ph

Region 4B SHEILA GRACE SORIANO

Western Philippines University
Aborlan, Palawan 5302
Mobile No.: 0907 736 6213
Email: sheilagracesoriano@gmail.com

Region 5 GLENDA G. QUINTO

Ateneo de Naga University
Ateneo Ave., Naga City 4400
Tel. No: (054) 881 2388 loc 2042
Mobile No.: 0918 641 0224
Email: gquinto@gbox.adnu.edu.ph

Region 6 FERDINAND MONOSO

Central Philippine University
Jaro, Iloilo City 5000
Mobile: 0917 302 5122
Email: fmonoso@yahoo.com

Region 7 LORNA S. ALMOCERA

University of the Philippines Cebu
Lahug, Cebu City 6000
Tel. No.: (032) 233 8203
Mobile: 0917 327 6390
Email: lsalmocera@yahoo.com

Region 8 ORESTE M. ORTEGA JR.

Leyte Normal University
Paterno St., Tadolban City 6500
Tel. No.: (053) 321 5628, Fax: (053) 325-6122
Mobile: 0928 405 7565
Email: oresteortegajr@lnu.edu.ph

Region 9 ROCHELLEO MARIANO

Ateneo de Zamboanga University
La Purisima St., Zamboanga City 7000
Tel. Nos: (062) 991 0871 loc 2243 / 2245
Mobile: 0906 626 9260
Email: rromeo_4747@yahoo.com
marlanoroce@atzu.edu.ph

Region 10, 12, & ARMM EMMY CHACON

MSU - Iligan Institute of Technology
Andres Bonifacio Ave., Iligan City 9200
Tel. No: (063) 221 4050 loc 4140
Mobile: 0917 417 0615
Email: emmy.chacon@g.msuiit.edu.ph

Region 11 JONALD P. FENECIOS

Ateneo de Davao University
Roxas Ave., Poblacion District, Davao City 8000
Tel. No. (082) 222 2411 loc 8320
Mobile: 0932 729 1855
Email: jpfenecios@addu.edu.ph

Region 13 MIRALUNA L. HERRERA

Caraga State University
Ampayon, Butuan City 8600
Tel. No.: (085) 342 1079, Fax: (085) 342 1079
Mobile: 0917 770 7068
Email: miraherrera71@yahoo.com

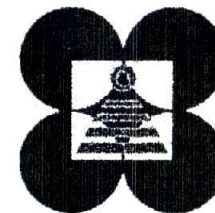
NCR RENIER G. MENDOZA, JESUS PAOLO E. JOVEN

University of the Philippines Diliman
Diliman, Quezon City 1101
ENGEL JOHN DELA VEGA
Ateneo de Manila University
Katipunan Ave., Quezon City 1108
Mobile: 0906 332 3658
Tel. No.: (032) 920 1009
Email: 21stpmnocr@gmail.com

PMO CORE COMMITTEE

Director: MA. NERISSA MASANGKAY-ABARA
National Secretary: DENNIS T. LEYSON
Treasurer: VICTORIA MAY E. PAGUIO

Brought to you by:



In partnership with:



The 21st Philippine Mathematical Olympiad

What is the PMO?

The Philippine Mathematical Olympiad is the oldest and most prestigious nationwide mathematics competition among high school students. The PMO is designed to select the best high school students in mathematical problem-solving through a friendly competition.

Objectives

The PMO aims to:

- stimulate the improvement of mathematics education in the country by awakening greater interest in and appreciation of mathematics among students and teachers and gaining insights into the levels of mathematics learning;
- identify and motivate the mathematically gifted;
- identify potential participants to the International Mathematical Olympiad;
- provide a vehicle for the professional growth of teachers; and
- encourage involvement of public and private sectors in the concerted promotion and development of mathematics education.

General Guidelines and Scheme of Conduct

The PMO is open to all junior and senior high school students. It shall be carried out in three stages:

1. **QUALIFYING STAGE - 20 October 2018 (Sat):** The Qualifying Stage is a multiple choice exam which will be administered in each area (Luzon, Visayas, Mindanao, NCR). There will be one testing site for each region.
2. **AREA STAGE - 24 November 2018 (Sat):** The Area Stage is a written competition among students in each area who will qualify based on their performance in the Qualifying Stage.
3. **NATIONAL STAGE - 26 January 2019 (Sat):** The National Stage is a written and oral competition among the winners of the Area Stage competition. This will be held in Metro Manila.

Test development (preparation, analysis and evaluation of questions and problems to be used in the competition) begins in September 2018 and continues throughout the year. For more information, visit our websites: pmo.ph OR facebook.com/PhilippineMathematicalOlympiad. For inquiries, email us at pmo@math.upd.edu.ph.

Participants' Qualifications

Qualifying Stage

- This competition shall be open to all junior and senior high school students in the country. Each of the participating schools may send a **maximum of 30 contestants**.
- Any bona fide student of private or public secondary high schools as specified above with a final grade of 88% (or its equivalent) in mathematics in the previous school year may apply.
- Participants will be asked to pay PHP 150.00 upon registration to the PMO coordinator of their region.

Area Stage

- The participants with the top fifty scores per area (Luzon, Visayas, Mindanao and NCR) will qualify for the area stage.

National Stage

- The participants from the area stage with the top twenty scores in national ranking will qualify for the national stage.

Format of the PMO Competition

Qualifying Stage

- The qualifying stage competition is a 25-item multiple-choice exam consisting of
 - Fifteen problems worth 2 points each
 - Ten problems worth 3 points each
- And five problems that will require answers only worth 6 points each

Area Stage

- The area stage competition is in the form of a written exam consisting of
 - 20 problems that will require answers only;
 - 3 open-ended problems that will require full solutions.

National Stage

- This competition shall have two phases: the written phase and the oral phase.
 - In the written phase of the competition, the contestants will be given 4.5 hours to answer 4 open-ended problems that require full solutions.
 - In the oral phase of the competition, 30 problems are to be read to the participants. These problems are to be answered within a specified time for each item. This phase is open to the public.

Selection of Winners

Qualifying Stage

The answer sheets will be checked and scored by a team designated by the PMO Technical Committee. The checkers will be selected so that each one is not related up to a second degree of consanguinity or affinity to any PMO participant. None of them will be teaching in any secondary school in the country. Each paper will be checked and double checked so as to ascertain the correctness of the scores.

Area Stage

The answer sheets will be checked by a board of judges which consists of college/university professors of mathematics who are not related up to a second degree of consanguinity or affinity to any PMO participant; and who are not teaching in high school.

Each correct answer in the first portion will merit 3 points. A complete and correct solution in the open-ended portion will merit 10 points. Partial points may be given in the open-ended portion as decided by the board of judges.

National Stage

Written Phase

The answer sheets will be checked by a board of judges which consists of four college/university professors of mathematics who are not related up to a second degree of consanguinity or affinity to any PMO participant, and who are not teaching in high school.

A complete and correct solution will merit 7 points. Partial points may be given as decided by the board.

Oral Phase

The board of judges shall consist of three members appointed by the PMO Committee.

The thirty problems will be divided as follows:

- 15 problems worth 2 points each
- 10 problems worth 3 points each
- 5 problems worth 6 points each

The participants will be ranked according to the following basis:

- 70% of the score in the written phase plus
- 30% of the score from oral phase

The top three participants and their coaches will be given trophies and cash awards.

The national finalists of the PMO will be invited to the **Mathematical Olympiad Summer Camp (MOSC)** for the **International Mathematical Olympiad (IMO)**. The IMO is the largest and most prestigious annual international mathematics competition among secondary school students. The representatives of the country to the IMO will be selected from the participants of the MOSC.

Awards and Prizes for the PMO

Area Stage			National Stage		
1 st Place	Student	Medal	1 st Place	Student	P 20000 and Medal
	Coach	Certificate		Coach	P 5000 and certificate
	School	Certificate		School	Trophy
2 nd Place	Student	Medal	2 nd Place	Student	P 15000 and Medal
	Coach	Certificate		Coach	P 3000 and certificate
	School	Certificate		School	Trophy
3 rd Place	Student	Medal	3 rd Place	Student	P 10000 and Medal
	Coach	Certificate		Coach	P 2000 and certificate
	School	Certificate		School	Trophy

Regional Testing Centers

Region 1, CAR	University of the Philippines Baguio Baguio City	Region 8	Leyte Normal University Tacloban City
Region 2	Cagayan State University Carig Campus, Tuguegarao City	Region 9	Carlos Dominguez Hall, Ateneo de Zamboanga University, Zamboanga City
Region 3	Central Luzon State University Munoz City, Nueva Ecija	Regions 10	CSM Annex Building Mindanao State University – Iligan, Institute of Technology, Iligan City
Region 4A	Math Building, University of the Philippines Los Banos OR Galayan Educational Foundation, Inc., Lucena, Quezon	Region 11	Ateneo de Davao University Davao City
Region 4B	Western Philippines University – Puerto Princesa City Campus Sta. Monica Heights, PPC	Region 12* & ARMM*	CSM Annex Building Mindanao State University – Iligan, Institute of Technology, Iligan City
Region 5	Ateneo de Naga University, Naga City	Region 13	College of Education Building Caraga State University Ampayon, Butuan City
Region 6	Central Philippine University Jaro, Iloilo City	NCR*	University of the Philippines Diliman Ateneo de Manila University
Region 7	AS Building, University of the Philippines Cebu, Cebu City		

Stage Coordinators / Assistant Directors

Qualifying Stage	Area Stage	National Stage
EZRA AGUILAR	MELVIN VIDAR	JASMIN-MAE B. SANTOS
Dept. of Mathematics and Physics University of Santo Tomas	Math Department De La Salle University	Institute of Mathematics University of the Philippines-Diliman