



 Coron Island

PHILIPPINE INTERNATIONAL MATH AND SCIENCE OLYMPICS NATIONAL ROUND 2022



PIMSO Math

GENERAL INSTRUCTIONS

- ① You have 90 minutes to finish the test.
- ② You may write your solutions on the TEST BOOKLET.
- ③ Write your answers on the ANSWER SHEET.
- ④ After the test, you must SUBMIT to the proctor both the TEST BOOKLET and the ANSWER SHEET.
- ⑤ This test covers FOUR (4) CATEGORIES namely: ARITHMETIC & NUMBER THEORY, LOGICAL ANALYSIS, GEOMETRY, and COMBINATORICS.
- ⑥ There is a total of thirty (30) questions in this test. Each correctly answered question will be marked five (5) points. No point shall be deducted for incorrect answer.
- ⑦ You are NOT ALLOWED to use any calculating device during the test proper.
- ⑧ Any form of cheating is a ground for DISQUALIFICATION.

BEGIN HERE:

1. N is a 3-digit number such that all digits are divisible by a common whole number that is not 1, but all digits are also different from each other. What is the maximum possible value of N ?
2. "A" is 102 more than 51 and "B" is 72 less than 99. What is $A+B$?
3. What is the sum of all counting numbers from 1 to 50?
4. What three consecutive counting numbers have a sum of 300?
5. If $\frac{N}{20} - \frac{3}{15} = \frac{6}{10}$, what is the value of N ?
6. What is the remainder when the answer in #5 is divided by 3?

7. At the end of a meeting, four students shake hands with each other once. How many handshakes will be there altogether?

8. It is Leta's birthday today. She is 5 years older than Leo. If you add their ages the sum is 27. How old is Leta?

9. What is next in the series?

3A

4B

5C

?

10. Four moons – Deimos, Ganymede, Phobos, Titan – were talking to each other and comparing their sizes.

Titan said "I am bigger than Phobos."

Deimos said "Ganymede is bigger than Titan."

Phobos said "Titan is bigger than Deimos."

Ganymede said "Phobos is bigger than Deimos."

Which moon is the largest?

11. A clock shows 6:00 AM. If the minute hand points in the direction of west, then in which direction is the hour hand pointing?

12. If [Monday \rightarrow Saturday] and [Wednesday \rightarrow Monday], then [Thursday \rightarrow ____?]]

13. Find the number F if $F \times 17 \times 257 = 21,845$.

14. Find the number F if $F \times 5 \times 17 = 850$.

15. Simplify:

$$1,012 + 2,013 + 3,014 + 4,015 + 5,016 + 6,017 + 7,018 + 8,019 + 9,020 + 10,021 \\ + 11,022 + 12,023$$

16. Simplify $18,007 - 17,009 + 16,011 - 15,013 + 14,015 - 13,017 + 12,019$.

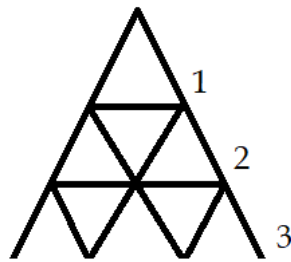
17. Simplify: $109 + 98 + 87 + 76 + 65 - 59 - 48 - 37 - 26 - 15$.

18. Find the number R if $R > F$ and $(R \times F \times 23) = 12,121$.

19. TRUE, FALSE, or SOMETIMES: All squares are rectangles.

20. How many small squares with width 2 cm can you cut out from a big square with width 10 cm?

21. Consider the figure below showing a portion of a series of triangles. How many smaller triangles are there in total from row 1 to row 5?



22. How many degrees of revolution does the minute hand of a clock make from 7 am to 9:30 am of the same day?

23. What do you call the quadrilateral with only one pair of parallel sides?

24. Harvey bought a lot with a width of 10 meters and a perimeter of 60 meters. What is the total area of the lot he bought?

25. Your mother separates a crate of 200 dragon fruits (*pitaya* or *pitahaya*) into 20 equal groups and put each group of dragon fruits in a plastic bag. How many dragon fruits are there in each bag?

26. How many counting numbers from 1 to 1,000 are not divisible by 4?

27. How many counting numbers from 1 to 30 are not divisible by 2 or not divisible by 3?

28. How many ways can we arrange the letters of KYIV?

29. Ian can only choose to join two international mathematics competitions from a list of five mathematical Olympiads: PIMSO, SIMSO, CISMO, Copernicus and Fermat. How many ways can this be done?

30. If Jin, J-Hope, Jimin, Jungkook, Suga, V and RM are to be seated in a circular table, how many seating arrangements are possible?

-END OF TEST-

Thank you for participating in the PIMSO National Round!