Philippine International Mathematical Olympiad

PhIMO

MOCK PAPER 2020

PRIMARY 5

NAME OF PARTICIPANT: _____ **DATE:** _____

SCHOOL NAME: _____

GENERAL INSTRUCTIONS:

1. Do not open the booklet until you are told to do so.
2. You are given 90 minutes to attempt all 25 questions.
3. Ensure to enter the necessary information asked in the Answer Sheet such as your name, participant number, country, and year level.
4. Record your answers neatly on the Answer Sheet provided.
5. Marks are awarded for correct answers only. There is no penalty for incorrect answers.
6. Calculators are not allowed.
7. All figures are not drawn to scale. They are intended only as aids.
8. Start answering when the proctor gives the signal.

Part 1 (Questions 1 to 10):

There are 10 multiple-choice questions. Choose the best answer from the four possible choices

Each question carries 2 marks

Part 2 (Questions 11 to 25):

There are 20 open-ended questions, each requiring a single answer. Write your answer on the box provided in the Answer Sheet

Questions 11 to 20, each carries 3 marks

Questions 21 to 25, each carries 5 marks

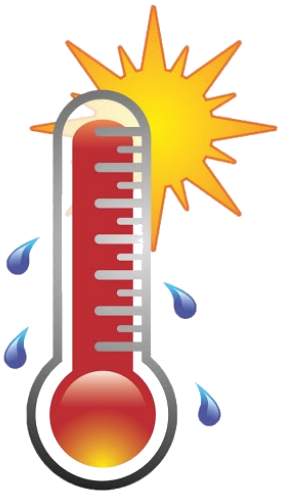
DO NOT REMOVE this exam paper from the exam venue

Part 1: 1st to 10th Multiple-choice Questions

1. Jackson needs to set up 90 chairs in rows such that each row must have an equal number of chairs and there must be more than 4 rows. How many ways can Jackson arrange the chair?

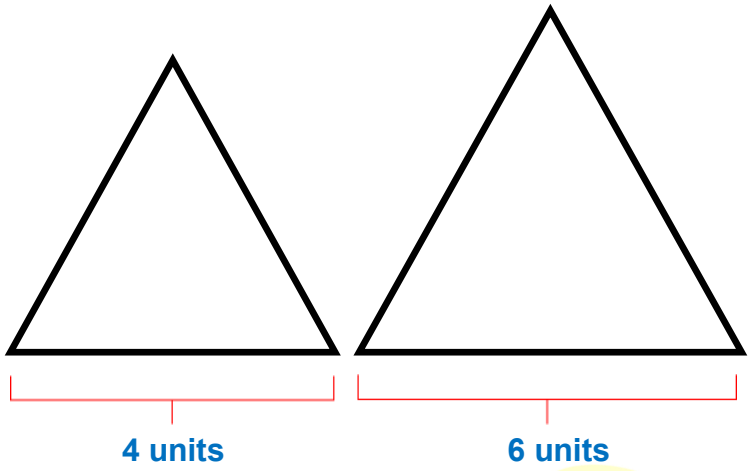
(a) 7 (b) 8 (c) 9 (d) 11

2. If $°C = 5/9\ (°F - 32)$ ' which among the following is the hottest?



(a) 45°C
(b) 110°F
(c) 20°C+ 70°F
(d) 77°F+ 13°C

3. Two equilateral triangles have sides 4 units and 6 units, respectively. Determine the ratio of the area of the smaller triangle to the area of the bigger triangle.



(a) 4/9 (b) 2/3 (c) 3/2 (d) 1/3

4. Given that a and b are both integers, find the value of a that gives the maximum value of b satisfying the equation

$$b = \frac{10a}{10-a}$$

(a) 10 (b) 11 (c) 9 (d) 5

5. Let a, b and c be positive integers such that a + b = 7 and b + c = 15. Find the sum of the greatest and smallest possible values of a + c.

(a) 28
(b) 22
(c) 30
(d) 32

6. On his first four quizzes, Shania earned a 14, 19, 18, and 15. (A perfect score would have been 20 points.) What does she need to earn on the next quiz to have an average score of at least 17?

(a) 14 (b) 16 (c) 17 (d) 19

7. Find the minimum value of n such that

$$1 + 2 + 3 + \ldots + n > 500$$

(a) 30 (b) 31 (c) 32 (d) 33

8. Determine the area of a triangle whose side lengths are 28 units, 45 units and 53 units.

(a) 330 (b) 630 (c) 660 (d) 1260

9. Determine the units digit of $(17)^{17^3}$

(a) 1 (b) 3 (c) 7 (d) 9

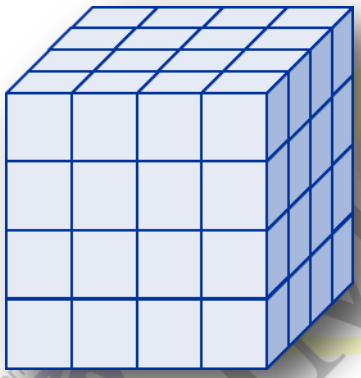
10. How many ways are there to arrange 3 boys and 3 girls to sit around a circular table?

(a) 24 (b) 120 (c) 720 (d) 5040

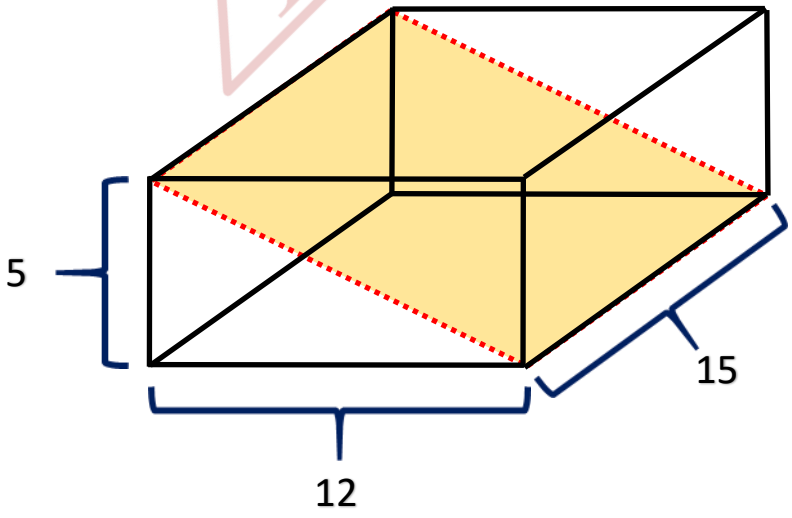
Part 2: 11th to 30th Open-ended Questions

11. A and B are prime numbers such that their product is 334 . Find the value of $A + B$.

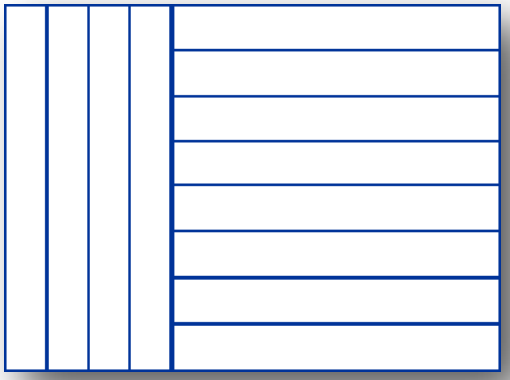
12. How many cubes are in the figure below?



13. A rectangular prism is divided into two identical figures by cutting along the marked line. What is the surface area of one cut figure?



14. The area of the figure below is 2400 square units. Find its perimeter.

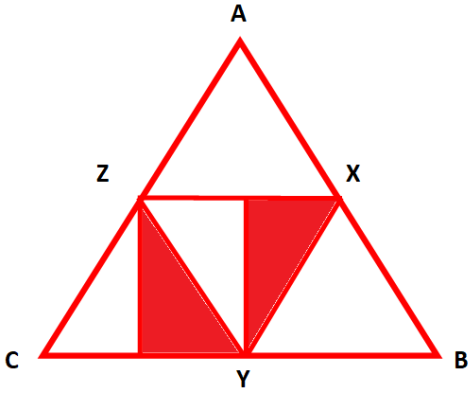


15. The sum of an integer and its reciprocal is 10/3. What is the integer?

16. Find the sum of the next two terms of the sequence

$$-\frac{1}{2}, -\frac{5}{6}, -\frac{7}{6}$$

17. ABC is an equilateral triangle with an area of 132 square units. X, Y and Z are midpoints of AB, BC and AC, respectively. Find the area of the shaded.



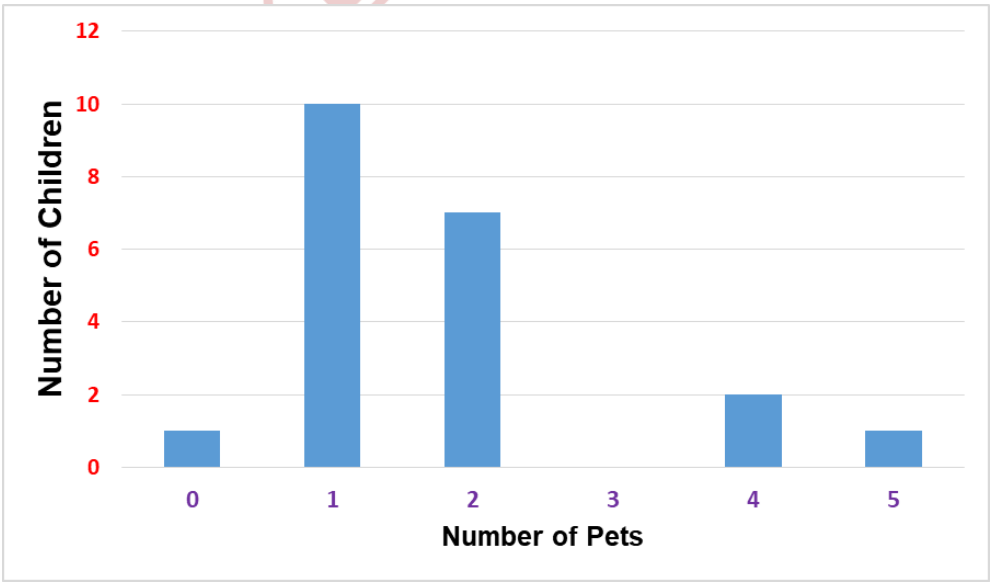
18. A water tank is 4/5 full of water. If 21 gallons of water were removed from the container, it would be 1/3 full. How many gallons of water can the water tank hold?

19. Today is August 25, 2020, Tuesday. Which day of the week was August 15, 1994?

20. It takes 5 hours for pump A to fill a tank of water. Pump B will take 6 hours to fill the same tank with water. We want to use 3 pumps, A, B and C to fill the tank in 2 hours. How long would it take pump C to fill the tank alone?

21. A quiz has 5 questions with each question worth one point. If 7% of the class got zero point, 5% got 2 points, 50% got 3 points, 15% got 4 points and 23% got perfect points, what is the average point of the class?

22. Elizabeth is recording the number of pets of each child in her class in a bar graph shown below. However, she has not drawn the column for the number of children that have exactly 3 pets.



The average number of pets per child is 2. How many children have exactly 3 pets?

23. There are 3 different coins in a piggy bank and 4 colours in a spinner. If you pick one coin and spin the spinner once, how many possible outcomes could you have?

24. In a room, 1/3 are wearing long socks, and 3/5 are wearing sweaters. What is the minimum number of people in the room wearing both long socks and sweaters?

25. If the mean of 7 integers is 8, what is the greatest possible value of the mode?