Philippine International Mathematical Olympiad

PhIMO

MOCK PAPER 2020

PRIMARY 4

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

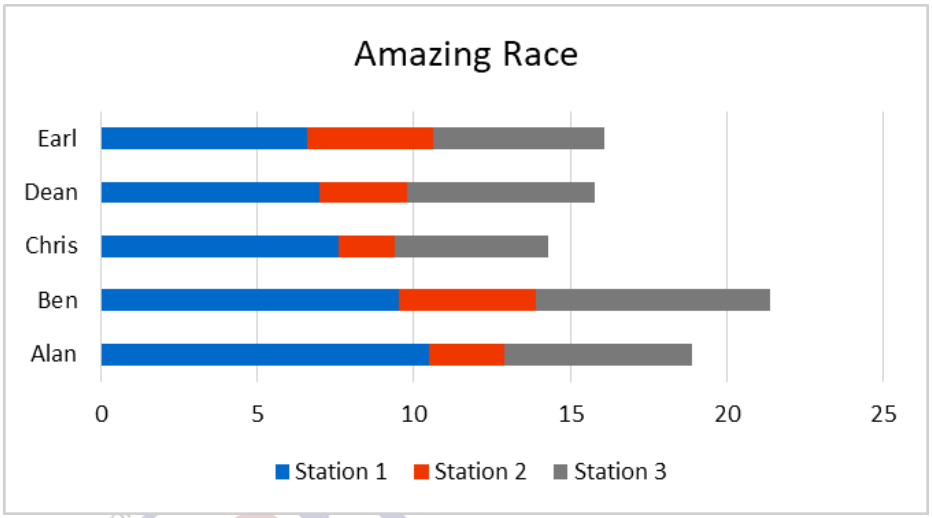
Questions 11 to 20, each carries 3 marks

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. The graph below shows the results on a 3-station amazing race. The bar shows how long (in minutes) each contestant finished the task in every station. According to the results, who was the 2nd most earliest to finished the race?

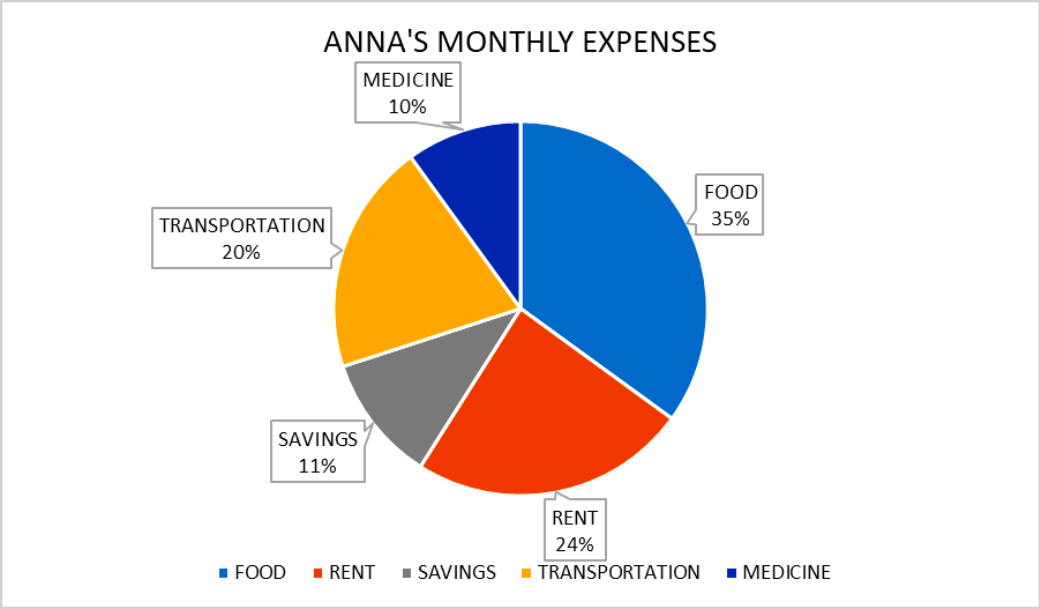


(a) Alan
(b) Dean
(c) Earl
(d) None of the above

2. In 48 hours, how many full rotations does the minute hand move on the clock face?

(a) 24
(b) 48
(c) 2880
(d) 720

3. Anna made a pie chart showing her average monthly expenses based on her monthly income of $1000.



How much does she spend for food and transportation?

(a) $360

(b) $500

(c) $550

(d) $650

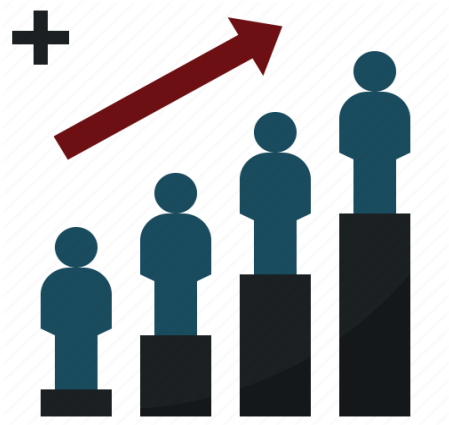
4. The populations of town X and town Y are in a ratio of 5:8. If the population of town X is increased by 80 percent, by what percent must the population of town Y be increased for the population of the two town be equal?

(a) 10%

(b) 12.5%

(c) 22%

(d) 8%



5. Find the value of $x^3 + x^2 + x^1$ if $x = 2$.

(a) 12

(b) 14

(c) 16

(d) 100

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

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

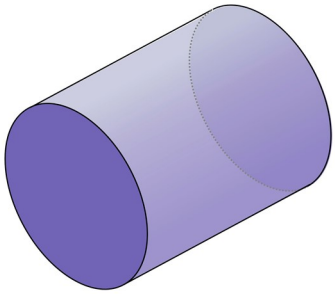
(a) 12/5

(b) 10/3

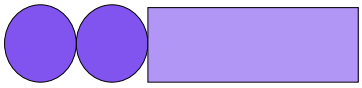
(c) 20/15

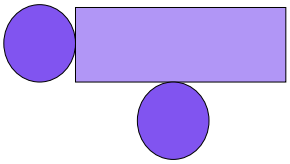
(d) 15/6

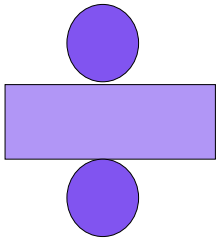
7. Identify the net of the solid below.



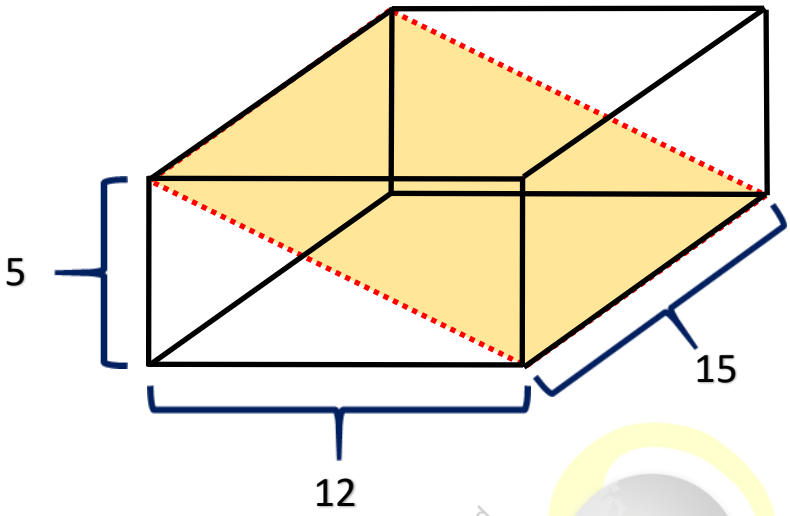
(a) 

(b) 

(c) 

(d) 

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



(a) 500 square units (b) 510 square units

(c) 630 square units (d) 315 square units

9. How many lateral faces does a prism with 120 edges have?

(a) 60 (b) 40 (c) 42 (d) 62

10. An operator ֍ is defined as:

$$2 \text{ ֍ } 3 = 13$$
$$4 \text{ ֍ } 2 = 20$$
$$3 \text{ ֍ } 5 = 34$$
$$1 \text{ ֍ } 3 = 10$$

Find the value of 5 ֍ 5

(a) 35 (b) 45 (c) 50 (d) 100

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

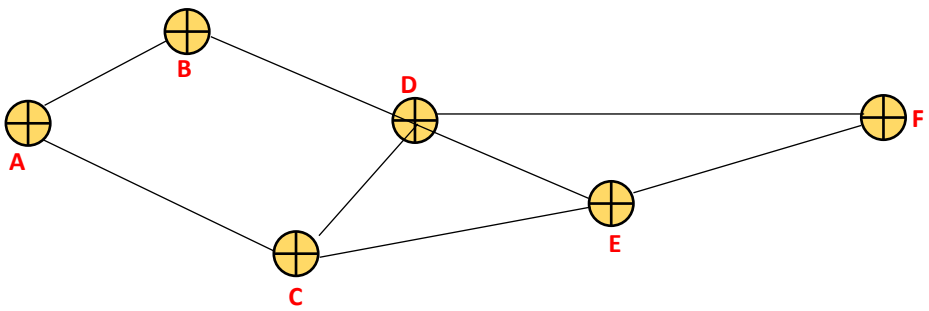
11. A prime number B is a sum of 3 prime numbers. What is the minimum value of B?

12. There are 5 integers whose sum is 13. What is the greatest possible product of these integers?

13. Amy made a new deck of 68 cards consisting 4 suits – spades, hearts, clubs and diamonds. If there are equal number of cards for each suit, determine the minimum number of cards should be drawn to ensure that there is at least 1 card from each suit?

14. Two balls are rolling towards each other at the same time from the opposite ends of a straight tube that is 424 centimetres long. Ball X travels 35 cm while Ball Y travels 25 centimetres in 1 second. Both balls travels 1 cm less than the previous distance in each subsequent second. How long will it take for the two balls to meet?

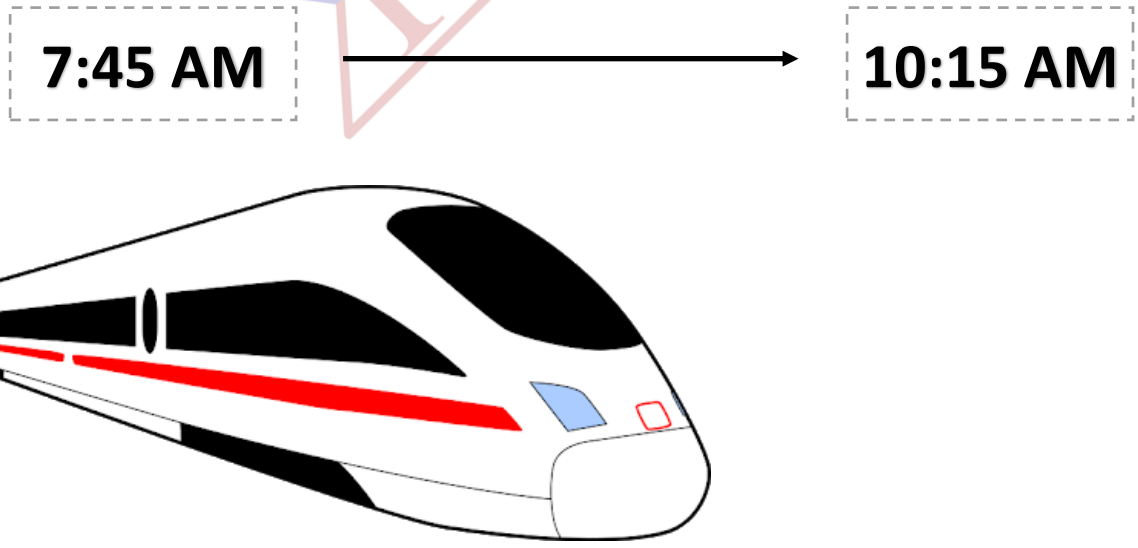
15. 6 towns are joined by a system of roads as shown:



How many different ways are there to get from town A to town F, if no town and no road should be passed more than once?

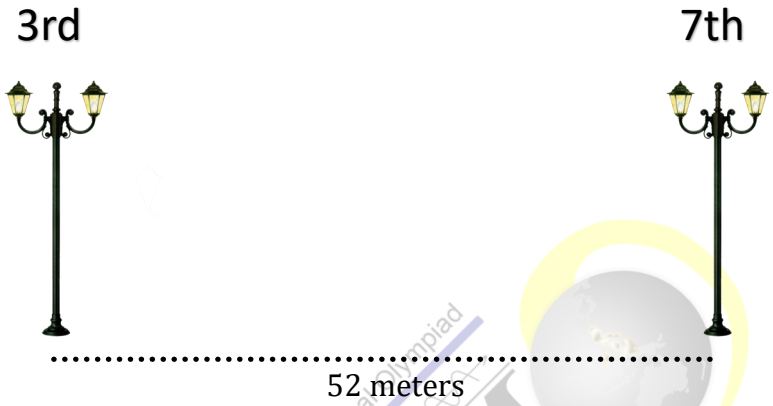
16. A jug filled with water weighs 20 pounds, when 1/2 of the water is poured out, the jug and the remaining water weigh 14 and 3/4 pounds. How much does the jug weigh?

17. A bullet train travels at a constant speed of 320 kilometers per hour. How far did the bullet train travelled if it left the station at 7:45 AM and reached its destination at 10:15 AM on the same day?



18. The length of a rectangle is thrice its width. If the length is increased by 25% while the width is decreased by 10%, by what percent is the increase of the area?

19. 15 lamp posts are equally spaced along one side of a straight road. The distance from the 3rd lamp post to the 7th lamp post is 52 meters. What is the distance between the first and the last lamp posts?



20. A number $\mathbb{R}$ greater than 120 but less than 150. It can be divided by 9 evenly. Find the sum of the possible values of $\mathbb{R}$.

21. Determine the value of ⍟ in the table below .

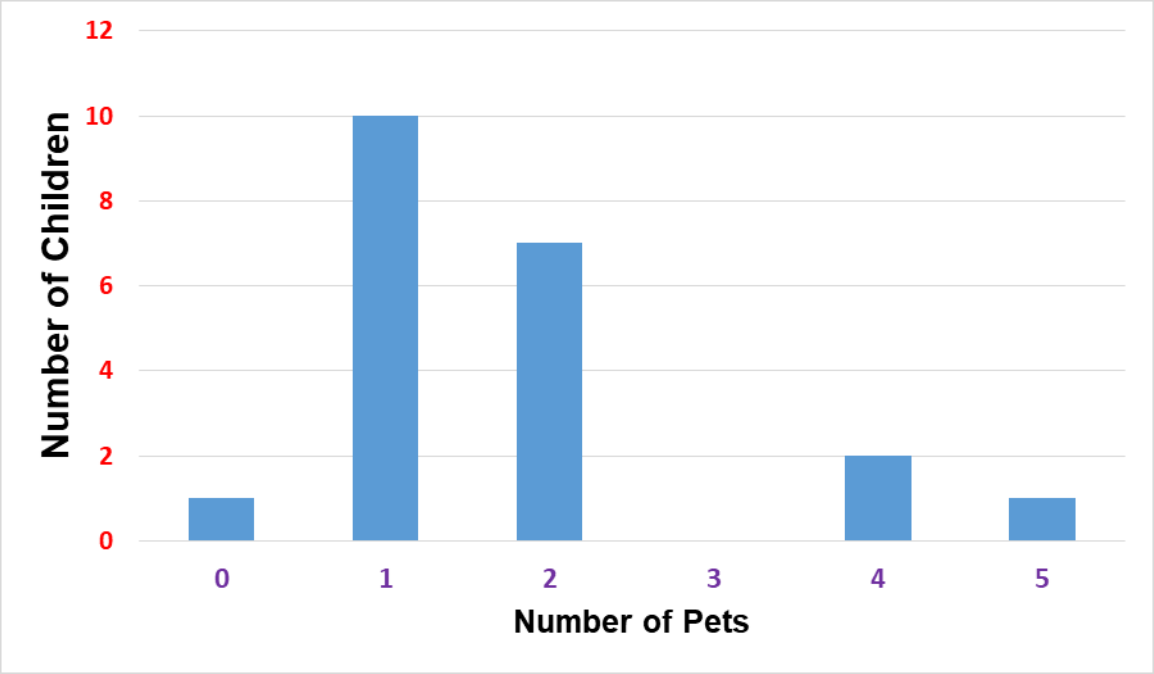
3	6	9	12	15	18	21	24
78	81	84	87	90	93	96	27
75						99	30
72	⍟					102	33
69						105	36
66						108	39
63	60	57	54	51	48	45	42

22. The sum of an integer and its reciprocal is 5/2. What is the integer?

23. According to the pattern below, find the 51st term of the sequence.

1010 , 1025 , 1040 , 1055 , ...

24. 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?

25. There are 3 different integers whose sum is 11. Find the greatest possible product of these integers.