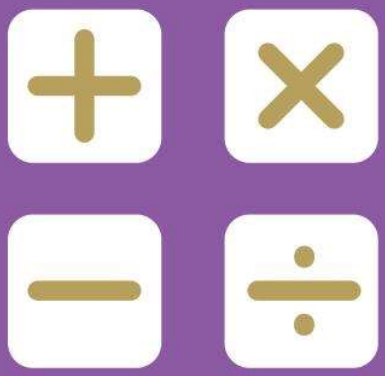
PAPER C



SEAMO X

Southeast Asian Mathematical Olympiad Extended Round

2019

DO NOT OPEN THIS BOOKLET UNTIL INSTRUCTED.

STUDENT'S NAME:

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Read the instructions on the **ANSWER SHEET** and fill in your **NAME, COUNTRY** and **CANDIDATE NUMBER**.
Use a 2B or B pencil.
Do **NOT** use a pen
Rub out any mistakes completely.

You **MUST** record your answers on the **ANSWER SHEET**.

UPPER PRIMARY

No marks are awarded for questions left **BLANK**.
ONE MARK is deducted for incorrect answers.

You must answer **ALL PARTS** of the question correctly.
INCOMPLETE questions are considered incorrect.

QUESTIONS 1 TO 10
Each correct answer is awarded **SIX MARKS.**

QUESTIONS 11 TO 15
Each correct answer is awarded **EIGHT MARKS.**

You are **NOT** allowed to use a calculator.

Section A

For questions 1 to 10, each correct answer is awarded 6 marks.

1. How many squares does a straight-line cross in the 2019th figure?

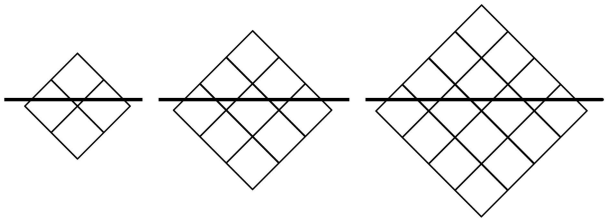

Fig. 1 Fig. 2 Fig. 3

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2. A pencil costs \$5, while a pen costs \$3. John paid \$45 for x number of pencils and y number of pens. Find 2 sets of values of x and y.

3. A balancing machine has the following weights:

$$1g, 2g, 4g, 8g, 16g$$

The weight(s) can only be placed on one end of the machine. How many measurements altogether can be taken?

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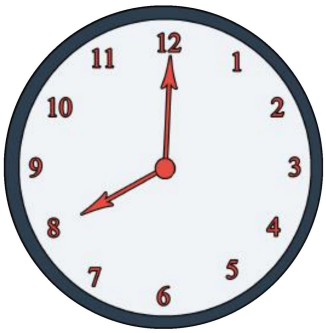
4. Maomao's old watch is slower by 2 minutes in every hour. At 8 o'clock in the morning she adjusts it to the standard time. What is the actual time when her watch shows 12 noon?



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5. It is known that

$$\begin{aligned} 5 \times 2 &= 5 + 6 \\ &= 11; \\ 3 \times 4 &= 3 + 4 + 5 + 6 \\ &= 18; \\ 6 \times 3 &= 6 + 7 + 8 \\ &= 21; \end{aligned}$$

Evaluate

$$1 \times 9 + 2 \times 9 + 3 \times 9 + \cdots + 9 \times 9$$

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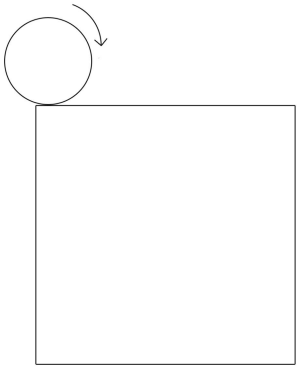
6. A circle of perimeter 1m rolls around the square of perimeter 4m.



How many turns does the circle make as it rolls around the square once without slipping?

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7. Alan, Ben and Charles took part in a test. The average test score of Alan and Ben is 2.5 marks higher than the average of the 3 children. The average mark of Ben and Charles is 1.5 marks less than the average of the 3 children. It is known that Ben scored 93. Find the score of Charles.

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8. Cindy has 12 sticks, each of different size. What is the minimum length of the longest stick such that no 3 sticks can form a triangle (in cm)?

9. The profit is 25% when a tennis racket is sold at its labeled price. The number of rackets sold is increased by another 1.5 times when the labeled price is discounted at 90%. Find the increased profit in percentage.

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10. The official date for SEAMO X is 19th January 2019, or 20190119.

    The sum of all digits of the date is 23.

    How many days are there in 2019 when the sum of all digits in the date is 23?

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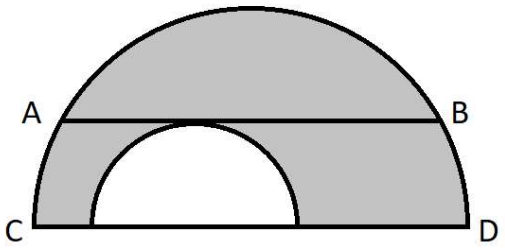
Section B

For questions 11 to 15, each correct answer is awarded 8 marks.

11. The figure below shows 2 semi-circles with the diameters lying on the same line CD. Given $AB \parallel CD$, $AB = 12\,\text{cm}$, find the area of the shaded region.
Take $\pi = 3.14$.



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12. $1-\cfrac{1}{r+\cfrac{1}{s+\cfrac{1}{t+\cfrac{1}{u+\frac{1}{s}}}}}=\cfrac{1}{1+\cfrac{1}{2+\cfrac{1}{2+\cfrac{1}{3+\frac{1}{3}}}}}$

Find the value of $(r+s+t+u)$.

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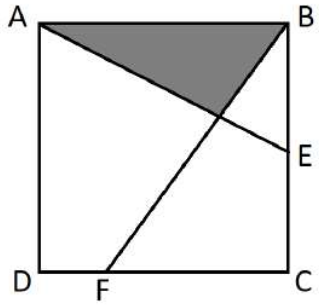
13. $ABCD$ is a square of side length $4\,\text{cm}$. E is the midpoint of BC, $DC = 4DF$. Find the area of the shaded region.



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14. Mark started jogging from Point A to Point B, and then going back and forth between the two points at a speed of $300\ \mathrm{m/min}$. At the same time, Nina started jogging from Point B to A, and then going back and forth between the two points at $240\ \mathrm{m/min}$.

    Both of them jogged for 30 minutes.

    It is known that the distance between Point A and Point B is $2400\ \mathrm{m}$.

    a) How many times did they meet?

    b) Find the distance when their meeting point was nearest to Point A.

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15. a, b, c are 3 consecutive whole numbers such that a is divisible by 15, b is divisible by 17, c is divisible by 19. Find the values of a, b, c.

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