SASMO
Singapore & Asian Schools Math Olympiad

**SASMO 2025 MOCK TESTS**
Grade: 7
Time allowed: 90 minutes
**TEST 1**

PIONEER EDUCATION

**INSTRUCTIONS.** Please read all the instructions below carefully.

a) Please DO NOT OPEN the contest link until the Proctor has given permission to start.

b) There are a total of 25 questions, which are divided into three parts. In the first part, choose only ONE correct answer among the 5 choices and darken its corresponding circle in your answer sheet. In the second part and third part, write the final answer for each question and darken their corresponding circles in your answer sheet.

c) Write your answers in the respective blank.

- When the answer is a 1-digit number, type "000" for the tens, the hundreds and the thousands place. Example: if the answer is 7, then type 0007.
- When the answer is a 2-digit number, type "00" for the hundreds place and the thousands place. Example: if the answer is 23, then type 0023.
- When the answer is a 3-digit number, type "0" for the thousands place. Example: if the answer is 191, then type 0191.
- When the answer is a 4-digit number, type as it is. Example: if the answer is 6419, then type 6419.

d) Dictionaries are allowed, but calculators are not.

e) Figures may not be drawn to scale.

**Remark.** Counting numbers are whole numbers except 0, i.e. $1, 2, 3, 4, 5, \ldots$

# GOOD LUCK!


LIVEWORKSHEETS

## A SECTION A (CORRECT ANSWER = 2 MARKS; NO ANSWER = 0; INCORRECT ANSWER = MINUS 1 MARKS)

**Question 1.** Find the value of the following:

$$20242025 \times 20252024 - 20242024 \times 20252025$$

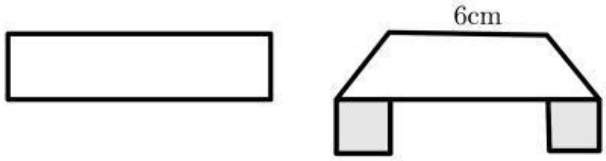
(A) 1 000. (B) 10 000. (C) 100 000.
(D) 1 000 000. (E) None of the above.

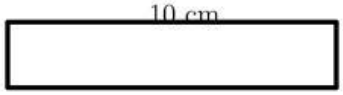
**Question 2.** Find the largest value of $x + y + z$ where $y > x$ and $x, y, z \in \mathbb{N}$ such that:

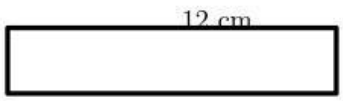
$$2^x + 2^y = 3^z$$

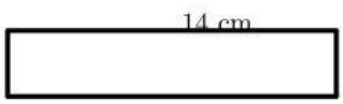
(A) 2. (B) 5. (C) 8.
(D) 9. (E) None of the above.

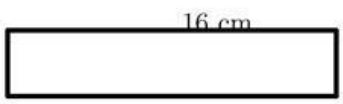
**Question 3.** A rectangular strip of paper, colored on one side, is folded into two squares (4 cm side) and one trapezoid. Which choice is correct after reopening?




(A) 


(B) 


(C) 


(D) 

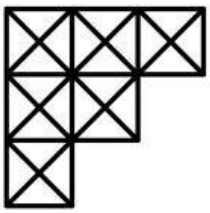

(E) None of the above.


LIVEWORKSHEETS

**Question 4.** Consider a number $3^n$, where $n$ is a positive integer. If $n = 2016$, the last digit of $3^n$ is a. If $n = 9018$, the last digit of $3^n$ is b. What is $a + b$?

(A) 1. (B) 9. (C) 10. (D) 8. (E) 12.

**Question 5.** Find the total number of triangles in the figure below.



(A) 41. (B) 42. (C) 43. (D) 44. (E) 45.

**Question 6.** The form teacher conducted a survey to find the distance of students' home from the school. The results are shown in the table below.

| Distance from school ($d$ km) | $0 < d \leq 1$ | $1 < d \leq 2$ | $2 < d \leq 3$ | $3 < d \leq 4$ | $4 < d \leq 5$ |
|---|---|---|---|---|---|
| Number of students | 13 | $x$ | 8 | 7 | 3 |

When the data is represented on a pie chart, the angle of sector representing the class $3 < d \leq 4$ is $60^o$. Find the value of $x$.

(A) 9. (B) 10. (C) 11.
(D) 12. (E) None of the above.

**Question 7.** A number X has factors 3, 4 and 6. Another number Y has factors 4, 8 and 12. Find the smallest value of X + Y.

(A) 12. (B) 24. (C) 36.
(D) 48. (E) None of the above.

**Question 8.** The digit 1, 2, 3, 4 and 5 are each used one to write a five-digit number ABCDE. The three-digit number ABC is divisible by 4, BCD is divisible by 5, and CDE is divisible by 3. Find the five-digit number ABCDE.

(A) 12354. (B) 12353. (C) 24153.
(D) 23451. (E) None of the above.

**Question 9.** A palindrome is a number that remains the same when digits are reversed. How many 3-digit palindrome number are less than 600 and are not divisible by 3 or 7?

(A) 500. (B) 484. (C) 19.
(D) 16. (E) None of the above.

**Question 10.** In a college, 200 students are randomly selected. 140 like tea, 120 like coffee and 80 like both tea and coffee. How many students like at least one of the beverages?

(A) 60 . (B) 40 . (C) 80 .
(D) 180 . (E) None of the above.

**Question 11.** Johnson wants to form 8-digit numbers using numbers from 1 to 8 once. How many 8-digit prime numbers can he form?

(A) 0. (B) 10. (C) 96.
(D) 134. (E) None of the above.


LIVEWORKSHEETS

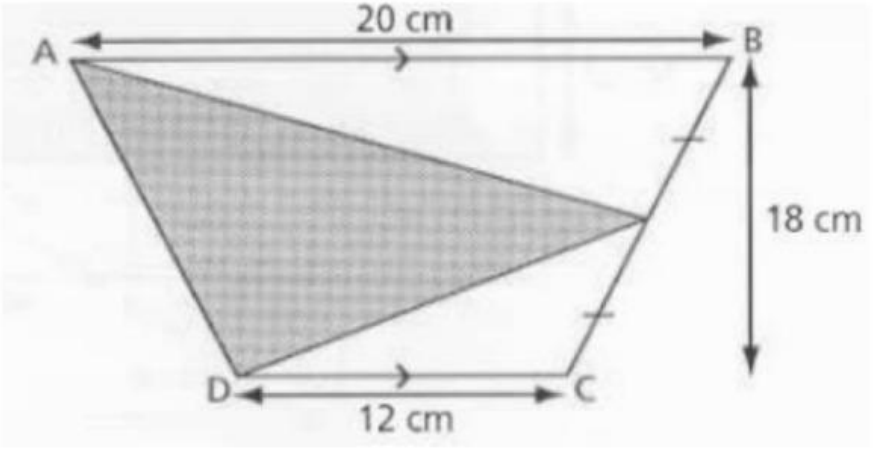
**Question 12.** Find the smallest whole number such that the product of 575 and the number is a perfect square.

(A) 25. (B) 23. (C) 5.
(D) 115. (E) None of the above.

**Question 13.** If we write whole numbers starting from 1 to from a 1000-digit number N as follows: N = 123456.... what is the remainder when N is divided by 250?

(A) 193. (B) 203. (C) 213.
(D) 223. (E) None of the above.

**Question 14.** $ABCD$ is a trapezium. Find the shaded area.




(A) 144. (B) 288. (C) 576.
(D) 1152. (E) None of the above .

**Question 15.** Study the following pattern

$$\begin{aligned} <2> &= 1 \\ <3> &= 1 \\ <4> &= 1+2 \\ <5> &= 1 \\ <6> &= 1+2+3 \quad = 6 \\ <7> &= 1 \\ &\cdots \end{aligned}$$

Evaluate $< 56 >$.

(A) 1. (B) 36. (C) 64.
(D) 120. (E) None of the above .

## B SECTION B: CORRECT ANSWER = 4 MARKS; INCORRECT OR NO ANSWER = 0

**Question 16.** Person A has some number of pieces of candy. Person B has exactly one-half as many as Person A. Person C has exactly one-third as many as Person B. Person D has exactly one-quarter as many as Person C. If D has at least 4 pieces of candy, what is the fewest number of pieces of candy that the four have all together?


LIVEWORKSHEETS

**Question 17.** Let $\frac{A}{B}$ be the next fraction in the sequence below. If $\frac{A}{B}$ is a fraction in its simplest form, find the value of $A^2 + B^2$

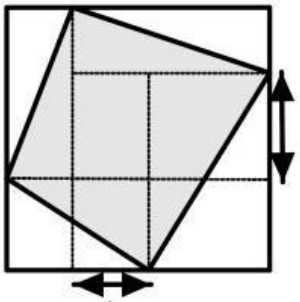
$$\frac{1}{3}, \frac{1}{3}, \frac{3}{10}, \frac{4}{15}, \frac{5}{21}, \frac{3}{14}, \ldots$$

**Question 18.** A boat travels 360 miles downstream in the same time it takes to travel 120 miles upstream. If the speed of the boat in still water is $12mph$, find the speed of the current.

**Question 19.** How many digit "1" in the following 140-digit number:

$$112123123412345\ldots$$

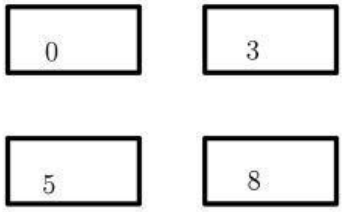
**Question 20.** The diagram shows a square of sides 20 cm. Find the area (in $cm^2$) of the shaded region.



**Question 21.** Given that |a| = 3; b = |5| and $a > b$. Find the value of $\sqrt{2a^2 - ab - b^2 + 1}$.

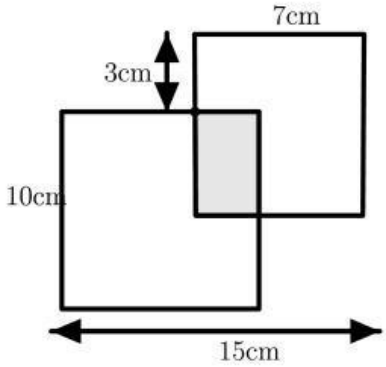
**Question 22.** Find the value of $\sqrt{9 - 4\sqrt{5}} + \sqrt{9 + 4\sqrt{5}}$

**Question 23.** There are four cards as shown below.




Using each card only once, how many different 4-digit numbers which are greater than 5000 can be formed using the four cards?

**Question 24.** Two squares of length 7 cm and 10 cm overlapped each other as shown in the diagram below. Find the area of the overlapping region.




**Question 25.** ABC is a prime number and *AC*BC is its square. Find $A + B + C$.

**THE END**


LIVEWORKSHEETS