

2024-2025 Junior Mathematical Olympiad

Round One Examination (Grades 5 and 6) - 1:00pm

For each question, determine the letter corresponding to the correct or best response; along with the question number, indicate this letter by shading it on the answer sheet

1. Which of the following numbers is largest?

(A) 1.0031 (B) 0.123 (C) 0.0970 (D) 0.999 (E) 0.9

2. What is the value of the quotient

$$\frac{20 \times 30 \times 40}{2 \times 4 \times 6}?$$

(A) 5 (B) 10 (C) 50 (D) 100 (E) 500

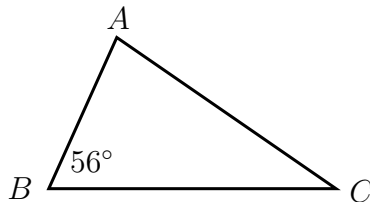
3. Let a, b, c, d be integer numbers. Given that $f(abcd) = \frac{a+b+c+d}{4}$, the value of $f(2025)$ is between

(A) 0 and 1 (B) 1 and 2 (C) 2 and 3 (D) 3 and 4 (E) 4 and 5

4. Twelve children are lined up to enter the school bus. Sydoni is the 7th from the front and Karl is the 2nd from the back. How many children are there between Sydoni and Karl?

(A) 2 (B) 3 (C) 4 (D) 5 (E) 6

5. The diagram shows triangle ABC . The angle at B ($\angle ABC$) is 56° .



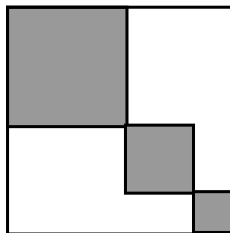
What is the sum of the other two angles ($\angle BAC + \angle ACB$)?

(A) 112° (B) 56° (C) 304° (D) 144° (E) 124°

6. What is the value of

$$\frac{2}{2 + \frac{2}{2+2}}?$$

- (A) 2 (B) 1 (C) 1/2 (D) 2/5 (E) 4/5
7. In a box there are three boxes, and each of these (three) boxes contains three smaller boxes. How many boxes are there in total?
(A) 9 (B) 10 (C) 12 (D) 13 (E) 15
8. Drey the Dragon has 5 heads. Every time one of its heads is chopped off, 5 new heads grow. Six of Drey the Dragon's heads are chopped off, one by one. How many heads does Drey the Dragon have in the end?
(A) 26 (B) 27 (C) 30 (D) 28 (E) 29
9. At a prune factory, fresh prunes are dehydrated to produce dried prunes. 4 kilograms of fresh prunes produce 1 kilogram of dried prunes. How many kilograms of fresh prunes are needed to produce 4 kilograms of dried prunes?
(A) 12 (B) 16 (C) 18 (D) 20 (E) 24
10. The diagram below shows a square with side length 6 cm and is partially shaded. The largest shaded region is a square with side length 3 cm. The other two shaded regions are squares with side lengths 2 cm and 1 cm. What is the total area (in cm^2) of the unshaded region?



- (A) 12 (B) 18 (C) 22 (D) 24 (E) 30
11. The pages of a book are numbered 1, 2, 3, 4, 5, ... and so on. The digit 5 appears exactly 16 times. What is the maximum number of pages the book can have?
(A) 56 (B) 64 (C) 72 (D) 80 (E) 88
12. The width of a rectangular window is 30 cm and the height of the window is twice its width. What is the sum of the width and the height of this rectangular window?
(A) 30 cm (B) 60 cm (C) 90 cm (D) 120 cm (E) 150 cm

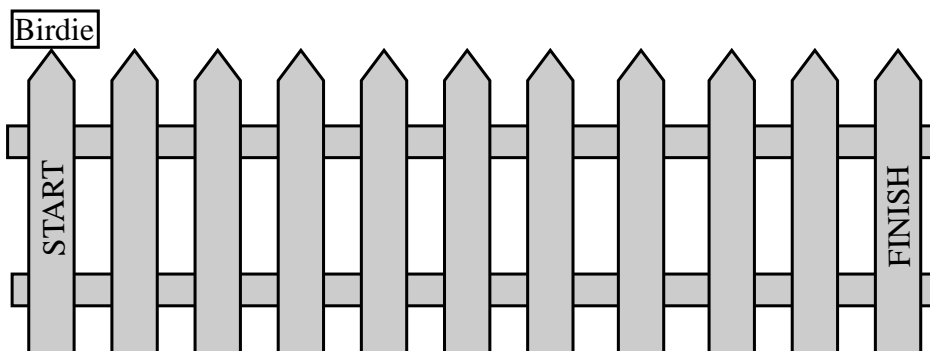
13. In order to get into a particular high school, Pat needs an average grade of 95 in her 5 courses. The grades for the first 3 courses are 90, 94 and 97. What must the average of her next two courses be if she is to achieve the 95 average (exactly)?
- (A) 95 (B) 96 (C) 97 (D) 98 (E) 99

14. A number, X , is inputted on a calculator. In order, the following four operations are performed, according to the arrows, to produce an output, O .

Input (X) \rightarrow " $\div 3$ " \rightarrow " $- 10$ " \rightarrow " $\div 3$ " \rightarrow " $- 10$ " \rightarrow Output (O)

The answers are displayed after each of the operations. If the output is $O = 8$, what is the value of the input, X ?

- (A) 189 (B) 192 (C) 195 (D) 198 (E) 201
15. Birdie is a bird that jumps on a fence from one post to another adjacent post. Each jump takes Birdie 1 second. Birdie makes 4 jumps ahead, then 1 jump back and again 4 jumps ahead and 1 jump back, and so on.



How many seconds does it take Birdie to go from START to FINISH?

- (A) 12 (B) 14 (C) 15 (D) 16 (E) 17
16. Simon had n marbles. He gave Michah half, and of the remaining number, he gave Carla half. Simon now has 40 marbles remaining. What is the value of n ?
- (A) 160 (B) 140 (C) 120 (D) 80 (E) 60
17. A full glass of water (glass with water) weighs 400 grams. The empty glass weighs 100 grams. How much does a half-full glass of water weigh?
- (A) 150 g (B) 200 g (C) 225 g (D) 250 g (E) 300 g
18. The dimension of a single square tile is 4×4 . Thirty such tiles are used to form a rectangle. What is the largest possible perimeter of this rectangle?
- (A) 88 (B) 136 (C) 248 (D) 360 (E) 480

19. In the array of numbers shown below, the numbers in the top row (8, 9, 17, 6, 4) are given. For the others, each number is the positive difference of the two numbers to the right and left in the row immediately above it.

$$\begin{array}{cccccc}
 8 & 9 & 17 & 6 & 4 & \\
 & 1 & 8 & - & 2 & \\
 & & 7 & - & - & \\
 & & & - & - & \\
 & & & & x &
 \end{array}$$

What is the value of x ?

- (A) 2 (B) 1 (C) 0 (D) 3 (E) 4
20. The sum of the digits of a 7-digit number is 6. What is the product of these digits?
 (A) 0 (B) 5 (C) 6 (D) 7 (E) Can be anything
21. There are two kinds of camels: B-camels that have 2 humps and D-camels that have 1 hump. Ten of these camels live in a zoo. Taken together, they have 14 humps. How many B-camels are there in this zoo?
 (A) 1 (B) 2 (C) 3 (D) 4 (E) 5
22. In the product shown, the letters p , q and r are representing digits.

$$\begin{array}{r}
 6 \ p \\
 \times \quad q \\
 \hline
 3 \ r \ 4
 \end{array}$$

What is the value of $p + q + r$?

- (A) 18 (B) 17 (C) 16 (D) 15 (E) 14
23. For how many of the whole numbers between 100 and 499 does the product of the ones' and tens' digit equal to the hundreds' digit.
 (A) 4 (B) 6 (C) 8 (D) 7 (E) 5
24. Tia, Mia and Kia are triplets. Their sister Francine is exactly 3 years older. Today all four children are celebrating their birthdays. Which of the following could be the total age of all four children?
 (A) 25 (B) 27 (C) 29 (D) 30 (E) 60
25. Let S_O be the sum of all the odd numbers from 1 to 2025 and let S_E be the sum of all the even numbers from 2 to 2024. It is well known that S_O is greater than S_E . What is the difference between S_O and S_E . That is, what is the value of $S_O - S_E$?
 (A) 1011 (B) 1012 (C) 1013 (D) 2024 (E) 2025