



# Spirit of Math.

Releasing the Genius.

**GRADE 5**

## Spirit of Math International Contest 2023

### INSTRUCTIONS

**1**

You have 60 minutes to write the contest.

**2**

The contest is multiple-choice with four choices for each question.

**3**

Write the CAPITAL letter of the answer you choose on the line to the right of each question and fill in the corresponding circle on the SoM Answer Sheet.

**4**

Each question answered correctly is worth one mark, and the sum of the correct answers is the score.

**5**

Marks are not taken off for wrong answers.

**6**

No calculators or other counting tools are allowed.

**Student Name:**

**Score:** /40



1)  $6 \times 3 - 28 + 5 = ?$   
 A) -15                      B) -5                      C) 5                      D) 15                      \_\_\_\_\_

2) Find the next number in the following sequence: 37, 32, 27, 22, \_\_\_\_.  
 A) 7                      B) 12                      C) 17                      D) 18                      \_\_\_\_\_

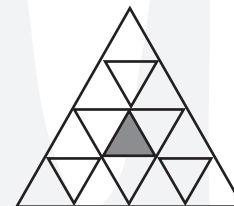
3) There are 63 art brushes in an art class. If each student needs exactly three brushes, the art class has enough brushes for how many students?  
 A) 12                      B) 21                      C) 63                      D) 189                      \_\_\_\_\_

4) Which of the following numbers is 64 **not** divisible by?  
 A) 2                      B) 3                      C) 4                      D) 8                      \_\_\_\_\_

5) A prime number is a number that is only divisible by 1 and itself. How many prime numbers are there between 1 and 20?  
 A) 7                      B) 8                      C) 9                      D) 10                      \_\_\_\_\_

6) Jacob ate  $\frac{1}{8}$  of one pepperoni pizza last night. How much of the pizza is left?  
 A)  $\frac{1}{8}$                       B)  $\frac{1}{4}$                       C)  $\frac{3}{4}$                       D)  $\frac{7}{8}$                       \_\_\_\_\_

7) The large triangle on the right is divided into 16 smaller equal-sized triangles. If the area of the shaded triangle is 2 units<sup>2</sup>, what is the area of the largest triangle?



A) 16 cm<sup>2</sup>                      B) 18 cm<sup>2</sup>                      C) 30 cm<sup>2</sup>                      D) 32 cm<sup>2</sup>                      \_\_\_\_\_

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Space for rough work



- 8) Yujin has a list of numbers: 3.333, 3.444, 3.412, and 3.335. Which number is the second largest number?  
 A) 3.444                      B) 3.335                      C) 3.412                      D) 3.333                      \_\_\_\_\_
- 9) I have twice as many pencils as erasers, and three times as many crayons as pencils. If I have 30 erasers, how many crayons do I have?  
 A) 5                              B) 20                              C) 45                              D) 180                              \_\_\_\_\_
- 10) In the magic square to the right, each row, column, and diagonal have the same sum. Which number does \* represent?
- |   |   |   |
|---|---|---|
| 4 | 9 | 2 |
|   | * |   |
|   |   | 6 |
- A) 1                              B) 3                              C) 5                              D) 7                              \_\_\_\_\_
- 11) Roham drinks water every 10 minutes and eats a snack every 12 minutes. If the last time Roham drank water and ate a snack was at 8 a.m., at what time will Roham drink water and eat a snack at the same time again?  
 A) 8:22 a.m.                      B) 8:30 a.m.                      C) 9:00 a.m.                      D) 10:00 a.m.                      \_\_\_\_\_
- 12) At Spirit of Dogs Doggy Daycare, there are 14 puppies you need to feed! Each dog eats 100 grams of food for lunch. If a bag of dog food contains 1000 g, what is the fewest number of bags of dog food you need to feed all puppies?  
 A) 1                              B) 2                              C) 3                              D) 14                              \_\_\_\_\_
- 13) There are 12 identical chocolates in a box. The weight of the box with the chocolates inside is 70 g. If the weight of the box without chocolates is 10 g, what is the weight of one chocolate?  
 A) 2 g                              B) 5 g                              C) 6 g                              D) 48 g                              \_\_\_\_\_

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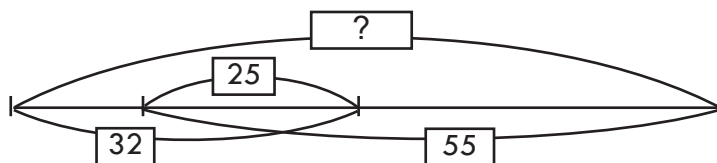
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14) How many fractions below are less than  $\frac{1}{2}$ ?

$$\frac{8}{9}, \frac{14}{15}, \frac{4}{7}, \frac{3}{10}, \frac{37}{180}$$

- A) 2                      B) 3                      C) 4                      D) 5                      \_\_\_\_\_

15) Which number is missing in the diagram below?

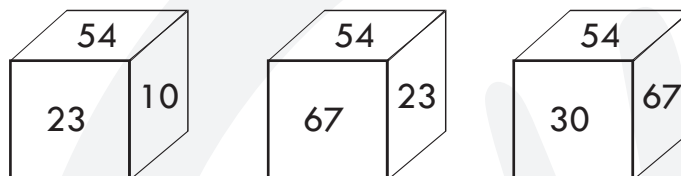


- A) 37                      B) 62                      C) 87                      D) 112                      \_\_\_\_\_

16) How many different ways can you arrange the letters in the word TABBY, including the arrangement that spells TABBY?

- A) 20                      B) 24                      C) 60                      D) 120                      \_\_\_\_\_

17) There are six different numbers written on each face of a cube. The image below shows three different views of the same cube. Which number is written on the face opposite the face with the 10?



- A) 23                      B) 30                      C) 54                      D) 67                      \_\_\_\_\_

18) To prevent from spreading a harmful virus, people need to keep a physical distance by staying 2 metres away from each other. On one very hot summer day, there were people lined up in front of an ice cream shop with 2 metres between each person. If the distance between the first person and the last person in line was approximately 1 km, how many people lined up for the ice cream?

- A) 50                      B) 500                      C) 501                      D) 1000                      \_\_\_\_\_

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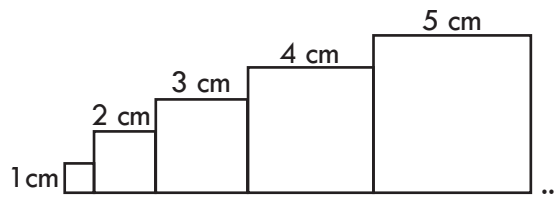


- 19) The average of a set of 8 numbers is 15. When the number 15 is removed from the set, what is the average of the remaining numbers?  
A) 0                      B) 7                      C) 14                      D) 15                      \_\_\_\_\_
- 20) If a scooter travels 20 m in 2 seconds, what is its speed in km/h?  
A) 36                      B) 60                      C) 72                      D) 360                      \_\_\_\_\_
- 21) How many multiples of 13 are there between 100 and 400?  
A) 22                      B) 23                      C) 30                      D) 31                      \_\_\_\_\_
- 22) The Olympics are international sporting event that happens every 4 years. The very first Olympics were held in 1896 in Athens, Greece. In which year was the 20<sup>th</sup> Olympics held?  
A) 1964                      B) 1968                      C) 1972                      D) 1973                      \_\_\_\_\_
- 23) When you round two certain whole numbers to the nearest hundred, you will get 3700 and 2800. What is the **largest** possible difference between the two numbers?  
A) 899                      B) 900                      C) 999                      D) 1000                      \_\_\_\_\_
- 24) A deck of 52 cards contains two black cards and two red cards of each number from 1 to 13. When choosing a card at random, what is the probability that the card chosen is a black prime number?  
A)  $\frac{6}{52}$                       B)  $\frac{3}{13}$                       C)  $\frac{7}{52}$                       D)  $\frac{7}{26}$                       \_\_\_\_\_
- 25) How many degrees does the minute hand on a clock move in 3 hours and 40 minutes?  
A) 1080°                      B) 1120°                      C) 1270°                      D) 1320°                      \_\_\_\_\_
- 26) Rhiya bought a toy for her puppy's birthday. She paid \$7 for the sales tax of 5%. The next day, the pet store had 20% off sale so Rhiya returned the toy and bought it again with the discount. How much did she pay for the toy after discount and sales tax?  
A) \$6.00                      B) \$29.40                      C) \$112.00                      D) \$117.60                      \_\_\_\_\_

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Space for rough work

- 27) Squares are drawn side by side such that the width of each square increases by 1 cm, as shown below. If you continue this pattern until there are 20 squares in total, what is the perimeter of the entire figure?



- A) 440 cm      B) 460 cm      C) 670 cm      D) 840 cm      \_\_\_\_\_
- 28) Mother noticed that someone ate her favourite doughnut. She suspected one of her three children, Dima, Svitlana, and Igor. The children made the following statements:  
 Igor said "Svitlana ate the doughnut."  
 Dima said "Igor did not eat the doughnut."  
 Svitlana said "I ate the doughnut."  
 If only one statement is true, then who ate the doughnut?  
 A) Dima      B) Igor      C) Svitlana      D) Impossible to solve      \_\_\_\_\_
- 29) Troy has a set of his favourite numbers that have the following characteristics:
- The numbers are two-digit numbers and multiples of 7.
  - The tens digit is greater than the ones digit.
  - The difference between the tens digit and ones digit is 1.
- What is the sum of these numbers?  
 A) 98      B) 119      C) 135      D) 175      \_\_\_\_\_
- 30) In Dora's favourite game "Wildlife", she gets to raise different wildlife animals! She started the game with rabbits and squirrels. She will have four rabbits after one week, 16 rabbits after two weeks, 64 rabbits after three weeks and so on. Dora will also have 2 squirrels after four days, 4 squirrels after 8 days, 8 squirrels after 12 days and so on. At least how many days does she need to play if she wants at least 256 rabbits and more than 64 squirrels?  
 A) 24      B) 26      C) 28      D) 32      \_\_\_\_\_

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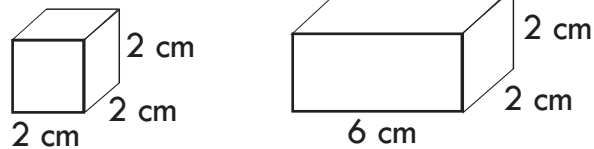
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- 31) A book that Elissa borrowed from a library has pages numbered from 1 to 237. How many times are the digits 3 and 7 printed?

A) 56                      B) 82                      C) 98                      D) 100                      \_\_\_\_\_

- 32) Mary has two blocks with different sizes. She is trying to build a cube with a length of 8 cm using the two blocks below. If she wants to use the least number of blocks, how many blocks does she need in total?



A) 16                      B) 22                      C) 32                      D) 64                      \_\_\_\_\_

- 33) Mika puts each of the numbers 2, 3, 6, and 10 once into the expression below to obtain a whole number. What is the difference between the largest and smallest possible whole number she can obtain?

$$\square + \square \times \square \div \square$$

A) 10                      B) 22                      C) 26                      D) 42                      \_\_\_\_\_

- 34) To calculate the factorial of a number (shown with the ! symbol), multiply all whole numbers from the given number down to 1. For example,  $4! = 4 \times 3 \times 2 \times 1$ . If you add up all the values of the factorials of the whole numbers from  $1!$  to  $50!$ , what would be the unit's digit of the sum?

A) 0                      B) 2                      C) 3                      D) 6                      \_\_\_\_\_

- 35) Sarah has a cube that has different colours on each face. She wants to ship the coloured cube to her cousin overseas. If she has a box that can exactly fit the cube in it, how many different ways can Sarah fit the cube in the box?

A) 6                      B) 12                      C) 18                      D) 24                      \_\_\_\_\_

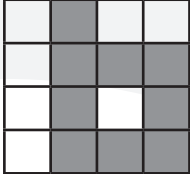
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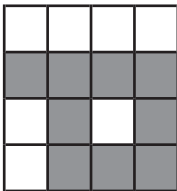
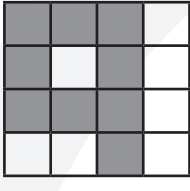
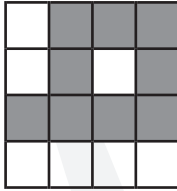
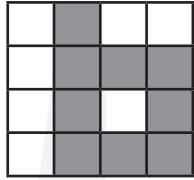
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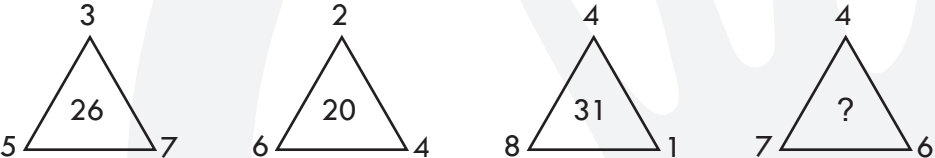
36) When  $5^{356}$  is written as an integer, what are the final four digits of that number?  
 A) 0125                      B) 0625                      C) 3125                      D) 8125                      \_\_\_\_\_

37) Nonstop trains leave Paris and London at the same time each day, going to the other city and passing each other along the main line. One train travels at 168 km/h and the other at 142 km/h. Assuming the track is straight, how many kilometres apart are the trains half an hour before they pass each other?  
 A) 13 km                      B) 26 km                      C) 155 km                      D) 284 km                      \_\_\_\_\_

38) After Halloween night, three siblings, Amir, Betty and Carl decided to share their candies. Amir took six less than one-fourths of the candies, Betty took three more than one-sixths of the candies and Carl took three more than Amir. If they have 20 candies left after sharing, how many candies did they start with?  
 A) 24                      B) 40                      C) 42                      D) 78                      \_\_\_\_\_

39) Jasmine drew a picture on the right by shading the grids on a graph paper. She flipped the picture vertically 9 times and rotated the picture 270 degrees counter-clockwise 13 times. After Jasmine has completed flipping and rotating, which of the following shows the correct picture?  


A)       B)       C)       D)  \_\_\_\_\_

40) Which number is missing from the centre of the fourth triangle?  
  
 A) 17                      B) 25                      C) 26                      D) 30                      \_\_\_\_\_

Space for rough work

