

GRADE 5

Spirit of Math International Contest 2021

In collaboration with SMILE developed by Stanford University

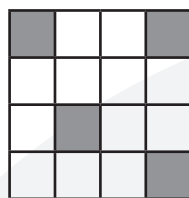
INSTRUCTIONS

- 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) $3 \times 5 - 25 + 6 = ?$
 A) -6 B) -4 C) 2 D) 4 _____
- 2) Find the next number in the following sequence: 6, 12, 24, 48, ____
 A) 72 B) 86 C) 92 D) 96 _____
- 3) The Sunnyside School Board has 48 solar panels to distribute equally among six schools. How many solar panels will each school receive?
 A) 6 B) 7 C) 8 D) 9 _____
- 4) The number 99 is divisible by which of the following?
 A) 4 B) 5 C) 6 D) 11 _____
- 5) A large square has been cut into 16 smaller squares, as shown below. The area of the large square is 16 units^2 . What is the area of the shaded part of the square?



- A) 2 units^2 B) 4 units^2 C) 6 units^2 D) 8 units^2 _____
- 6) Rachel left her house at 6:45 p.m. to walk her dog and returned home at 8:20 p.m. How long was Rachel walking her dog?
 A) 35 minutes B) 95 minutes C) 105 minutes D) 125 minutes _____
- 7) What is the sum of all the prime factors of the number 30?
 A) 10 B) 11 C) 12 D) 17 _____
- 8) In how many different ways can you arrange the letters in the word MATH, including the arrangement that spells MATH?
 A) 12 B) 20 C) 24 D) 32 _____

Space for rough work



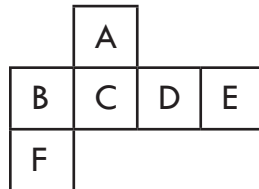
- 9) Integers are numbers in the set {... -3, -2, -1, 0, 1, 2, 3, ...}. Which of the following is **not** an integer?

A) $\sqrt{100}$ B) 5^2 C) 1.2 D) $\frac{9}{3}$ _____

- 10) How many **even** whole numbers are between $\sqrt{9}$ and $\sqrt{121}$?

A) 4 B) 5 C) 6 D) 7 _____

- 11) If you were to fold this net into a cube, what letter would be on the face opposite to A?



A) Face B B) Face D C) Face E D) Face F _____

- 12) *Master Juba* was one of the only tap dancers active in the 1840's. If *Master Juba* can tap 70 times per minute, how many taps would he make in 2 hours and 10 minutes?

A) 157.5 B) 4200 C) 8400 D) 9100 _____

- 13) One morning, the temperature starts at -10°C , rises by 4°C , then decreases by 11°C by noon. In the afternoon the temperature rises by 20°C , falls by 13°C , then rises another 3°C . What is the final temperature?

A) -10°C B) -7°C C) 0°C D) 1°C _____

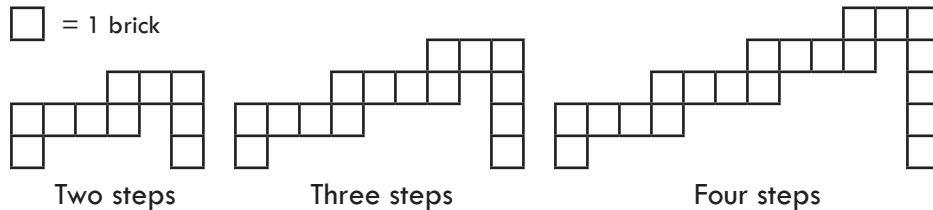
- 14) Fifteen sunflower seeds, with zero length, are planted in a straight line 10 cm apart from each other. How far is it from the first sunflower seed to the last?

A) 130 cm B) 140 cm C) 145 cm D) 150 cm _____

Space for rough work

- 15) At Lume's Light-bulbs, every 15 seconds an LED light-bulb is produced and every 20 seconds, an incandescent light-bulb is produced. If an LED light-bulb and incandescent light-bulb are both produced at 8:00 a.m., how long until they are produced together again?
 A) 30 seconds B) 45 seconds C) 60 seconds D) 100 seconds _____

- 16) Mr. Banister has hired you to build a staircase with 24 steps following certain specifications. The blueprint to build a staircase with two, three, or four steps is shown below. How many bricks do you need to build Mr. Banister's staircase?



- A) 96 B) 110 C) 120 D) 125 _____

- 17) When a certain glass is $\frac{5}{6}$ full, there is still room for 8 mL of water. How much water does this glass hold when it is completely full?
 A) 40 mL B) 48 mL C) 56 mL D) 88 mL _____

- 18) The only way to enter Marvin's Magic Museum is by telling Marvin a number he likes. Marvin likes the number 14, but does not like 15. He likes the number 21, but not the number 26. He likes the number 35, but not the number 39. Which of the following numbers will get you into the museum?
 A) 19 B) 25 C) 37 D) 42 _____

- 19) A box contains 15 sour candies, 12 caramel candies, and 20 gummy bears. If one candy is randomly taken from the box without looking, what is the probability that it is a sour candy?
 A) $\frac{1}{15}$ B) $\frac{15}{47}$ C) $\frac{20}{47}$ D) $\frac{1}{47}$ _____

- 20) Your cousin lives on a big farm with many kinds of animals. Among them, he has horses and cows. The ratio of horses to cows is 1:3. If your cousin owns 40 horses and cows in total, how many cows does he have?
 A) 10 B) 15 C) 20 D) 30 _____

Space for rough work



- 21) The average of three numbers is seven. When a fourth number is added, the new average is nine. What is the fourth number?

A) 11 B) 15 C) 18 D) 19 _____

- 22) A large rectangle is divided up into four smaller rectangles that have sides with integer lengths. The areas of three smaller rectangles are shown in the diagram below. What is the area of the fourth rectangle?

55 units ²	30 units ²
?	18 units ²

A) 22 units² B) 33 units² C) 45 units² D) 90 units² _____

- 23) If 4 apples and 6 bananas cost \$12 and 6 apples and 4 bananas cost \$18, how much would 7 apples and 7 bananas cost?

A) \$21 B) \$28 C) \$30 E) \$33 _____

- 24) Karima printed all of the natural numbers from 1 to 100 including 100. How many times did she print the digit 1?

A) 19 B) 20 C) 21 D) 22 _____

- 25) On a magic billiard table, there are fifteen balls numbered consecutively from 1 to 15. The balls roll around the table and cannot fall off. Any time two balls collide, a new ball replaces them and is numbered with their sum. After some time, only one ball remains. What number is on the last ball?

A) 15 B) 91 C) 105 D) 120 _____

- 26) I am thinking of three different natural numbers. The product of these three numbers is the same as the sum. Which of the following is one of the three numbers?

A) 3 B) 6 C) 10 D) 25 _____

Space for rough work

- 27) Chloe's favourite shapes are squares and hexagons. If she draws 10 figures that are either squares or hexagons, using a total of 48 sides, and no two figures share a side, how many of the figures are hexagons?
 A) 4 B) 5 C) 6 D) 7 _____
- 28) The number 450 is written as the product of four distinct positive integers, all greater than one. What is the largest possible integer that could be included? What is the best logical question you could ask to help you solve this problem?
 A) What are the multiples of 450? C) What is the largest integer less than 450?
 B) What is the prime factorization of 450? D) What is the square root of 450? _____
- 29) Every second, Aiko doubles the volume of her bubble gum balloon. If it takes her six seconds to blow the full size of the balloon before bursting, how long will it take Aiko to blow a half size balloon?
 A) 2 seconds B) 3 seconds C) 4 seconds D) 5 seconds _____
- 30) In an isosceles triangle, the obtuse angle is double the sum of the other two angles. What is the measure of one acute angle?
 A) 10° B) 15° C) 30° D) 45° _____
- 31) Four friends are sharing a bag of candies. First, Azra takes one half of all candies. Next, Paul takes one third of the remaining candies. Mina takes one half of what is left. Zhang takes the final 12 remaining candies from the bag. How many candies were in the bag originally?
 A) 36 B) 48 C) 72 D) 94 _____
- 32) A wooden cube with a volume of 64 cm^3 was completely covered in blue paint and left to dry. Then it was cut into eight equal smaller cubes. What is the total area of all faces of the smaller cubes that are not painted?
 A) 48 cm^2 B) 96 cm^2 C) 192 cm^2 D) 384 cm^2 _____

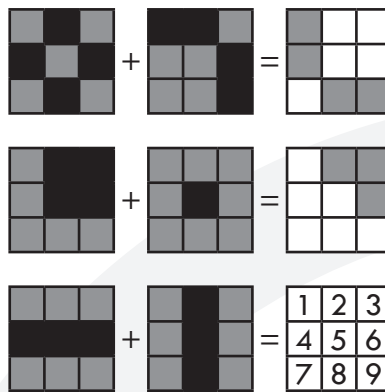


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33) The Xu family has five children aged 1, 3, 5, 7, and 9 years old. Adeline is not the oldest or the youngest. Bianca is two years apart from Constance. Adeline and Daria are four years apart. Elena is four years older than Constance. Daria is older than Elena. How old is Adeline?
 A) 1 B) 3 C) 5 D) 7 _____

34) Electrical engineer and inventor *Nikola Tesla* (1856-1943) was exceptionally bright, but eccentric at the same time. Supposedly, Tesla did not like to shake hands with other people. His fellow inventor *Thomas Edison* (1847-1931) invited him to a banquet. All people at the banquet shook hands with each other once. The total number of handshakes at the banquet was 78. How many handshakes was Tesla forced to make?
 A) 12 B) 13 C) 15 D) 16 _____

35) According to the rule shown in the first two sets of grids, which number(s) will be grey in the third set of grids?



A) 1, 3, 7, 9 B) 2, 4, 6, 8 C) 2, 4, 5, 6, 8 D) 5 _____

36) Your favourite trilogy, titled *Mathematical Secrets for Wizards*, is placed on a shelf in order (Volumes I to III) from left to right. If each book has 130 pages, excluding front and back covers, how many pages are between the first page of Volume I and the last page of Volume III, excluding all front and back covers?
 A) 0 B) 130 C) 260 D) 390 _____

Space for rough work



37) A computer is printing the following list: $7^1, 7^2, 7^3, \dots, 7^{202}$. When each term is evaluated, how many terms in this sequence have 9 as their last digit?

- A) 50 B) 51 C) 101 D) 102

38) A phone number in Canada contains a three digit area code followed by a seven digit local number, for example, (123) 456 - 7890. Your new friend Kevin gives you his phone number on a piece of paper, but when you take the number out to call him, four of the numbers are missing. The paper reads:

$$(626) 4 _ 5 - _ 2 _ _$$

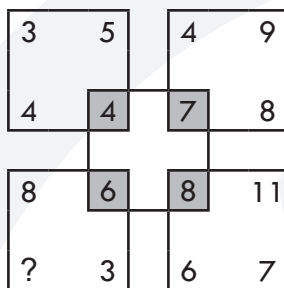
You recall the 10-digit number was a multiple of five and contained exactly one 9. Based on this information, how many different possibilities are there for Kevin's phone number?

- A) 162 B) 200 C) 486 D) 600

39) Kailey and Bailey decide to play a game to eat their 32-slice extra large pizza. On each turn, a player must decide how many slices of pizza to eat: 1, 2, 3, or 4 slices. The player who eats the last slice of pizza wins the game. Kailey knows she can guarantee her win if she goes first and eats a certain number of slices. How many slices of pizza will Kailey eat on her first turn to guarantee her win?

- A) 1 B) 2 C) 3 D) 4

40) The numbers in the squares below follow a certain pattern. What is the missing number?



- A) 7 B) 8 C) 9 D) 10

Space for rough work

