



KMMC 2

Karate Masters Mathematics Competitions 2

2nd Annual

KMMC 2 B

Saturday, December 3, 2022



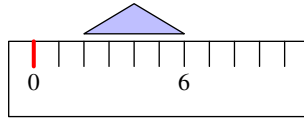
INSTRUCTIONS

1. Please don't open this booklet until you start the test.
2. This is a twenty-five question multiple choice test. For each question, only one answer choice is correct.
3. Answer the problems by typing your answers on the KMMC 2 Answer Form with a keyboard. Check the keys for accuracy and erase errors and stray marks completely.
4. **SCORING:** You will receive 1 point for each correct answer, 0 points for each problem left unanswered, and 0 points for each incorrect answer.
5. You can only use blank scratch paper, rulers, and erasers. Don't use anything else! No problems on the competition will require the use of a calculator.
6. Figures are not necessarily drawn to scale.
7. Before beginning the competition, your competition manager will not ask you to record your name and other information on the answer sheet.
8. You will have 25 minutes to complete the competition once you start the test.
9. When you finish the competition, don't sign your name in the space provided on the answer sheet.

If we find out you cheated, we will remove your score.

Please don't send the problems to someone else or talk about the problems before the contest is over, as it is cheating.

- Karate has 8 cookies and Judo has 3 cookies. How many more cookies does Karate have than Judo?
(A) 1 (B) 2 (C) 3 (D) 4 (E) 5
- At a store, Karate bought two chocolate bars, three milkshakes, and four donuts. How many total items did Karate buy?
(A) 6 (B) 7 (C) 8 (D) 9 (E) 10
- How many digits of the number 8935 are odd?
(A) 0 (B) 1 (C) 2 (D) 3 (E) 4
- Which of the following sums is the largest?
(A) $3 + 6$ (B) $4 + 8$ (C) $4 + 6$ (D) $5 + 6$ (E) $6 + 2$
- Each marking on the ruler below is 1 inch apart. Yuzuko used a ruler to measure the length of the triangle below and got an incorrect measurement of 6 inches. What is the actual length of the triangle in inches?

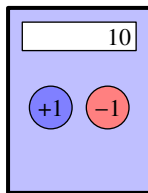


- (A) 4 (B) 5 (C) 7 (D) 8 (E) 9
- Judo is 2 years older than his brother, who was 13 years old last year. How many years old will Judo be next year?
(A) 13 (B) 14 (C) 15 (D) 16 (E) 17
- Karate is playing a video game with ten levels. If Karate skips two of the first five levels and four of the last five levels, but he beats the other levels, then how many levels does Karate beat?
(A) 3 (B) 4 (C) 5 (D) 6 (E) 7

8. The vertical distance from sea level in feet for five people are written on the chart below. Who is the closest to sea level?

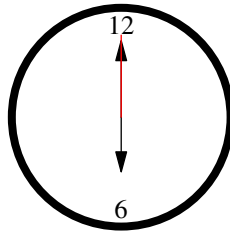


- (A) Ayaka (B) Haruka (C) Judo (D) Karate (E) Saya
9. Aki is counting sheep. In the first minute, he counts 17 sheep. In the second minute, he counts 13 sheep. In the third minute, he counts an odd number of sheep, more sheep than in the second minute, and fewer sheep than in the first minute. How many sheep does Aki count in those three minutes?
- (A) 41 (B) 42 (C) 43 (D) 44 (E) 45
10. The letters I, L, O, V, E, M, A, T, H represent the digits 1 through 9 from left to right. What is the 4-digit number represented by the word LATE?
- (A) 1674 (B) 1675 (C) 2784 (D) 2785 (E) 2895
11. Kinoko has a calculator that currently displays the number 10. The left button adds 1 to the current number, and the right button subtracts 1 from the current number. If Kinoko clicks the left button 10 times and then clicks the right button 7 times, what will the resulting number be?



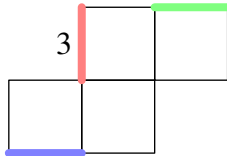
- (A) 7 (B) 13 (C) 15 (D) 17 (E) 27

12. Ryan has a number. If he subtracts 10 from the number, his result will be 8. If he instead adds 4 to the number, what will his result be?
(A) 6 (B) 12 (C) 16 (D) 22 (E) 26
13. A 2-digit number has two even digits that have a sum of 12, and the tens digit of the number is greater than the units digit. What is the number?
(A) 48 (B) 64 (C) 66 (D) 84 (E) 86
14. Karate has 37 strands of pasta, and he cuts 10 of the strands into two smaller strands of pasta. How many strands of pasta does he have now?
(A) 42 (B) 45 (C) 47 (D) 52 (E) 57
15. At the start of a two-hour period, Judo practices karate for 30 minutes, and then he takes a 10 minute break. This pattern of practicing and taking a break repeats until the period ends. How many breaks does Judo take?
(A) 2 (B) 3 (C) 4 (D) 5 (E) 6
16. Karate has to walk his dog 1 hour and 30 minutes after the time shown on the clock. At what time will Karate walk his dog?



- (A) 2:00 (B) 3:30 (C) 6:30 (D) 7:30 (E) 9:00
17. Ayaka goes to a bakery with \$15. A cookie costs \$2, while a cupcake costs \$3. If Ayaka buys 4 cupcakes, at most how many cookies can she buy?
(A) 0 (B) 1 (C) 2 (D) 3 (E) 4

18. Karate has a bag with 8 red chips, 6 blue chips, 9 green chips, 4 yellow chips, and 2 purple chips. If he randomly chooses a chip from the bag, what is the most likely color of the chip that is chosen?
- (A) red (B) blue (C) green (D) yellow (E) purple
19. Ayaka, Saya and Karate each own a different pet among a dog, cat, and fish. Ayaka does not own a fish, Saya does not own a cat or dog, and Karate does not own a cat. What pets do Ayaka, Saya, and Karate own, in that order?
- (A) fish, cat, dog (B) dog, fish, cat (C) cat, dog, fish
(D) fish, dog, cat (E) cat, fish, dog
20. How many 3-digit numbers are there such that all its digits are either 0 or 1?
- (A) 1 (B) 2 (C) 4 (D) 6 (E) 8
21. Karate last ate at a restaurant on a Monday, and he last ate at a dining hall on a Wednesday, which was 4 days ago. Which of the following could be the number of days since he last ate at a restaurant?
- (A) 13 (B) 14 (C) 15 (D) 21 (E) 22
22. The picture below shows four squares glued together by their sides. For each square, the numbers 1, 2, 3, and 4 are labeled on its sides in clockwise order. The labels of any two sides glued together are the same, and the label of the red side is 3. What is the sum of the labels of the blue and green sides?



- (A) 2 (B) 3 (C) 4 (D) 5 (E) 6
23. A number \square is smaller than a number \triangle , but the number $\square + 5$ is greater than the number $\triangle + 3$. Which of the following is a possible value of $\triangle - \square$?
- (A) 0 (B) 1 (C) 2 (D) 3 (E) 4

24. Ayaka, Judo, and Saya each buy a cake with the same size. Then, Ayaka, Judo, and Saya cut their cakes into 4, 4, and 2 equally-sized pieces, in that order. Finally, Ayaka, Judo, and Saya eat 1, 2, and 1 of their own pieces, in that order. Who eats the greatest amount of cake?
- (A) Ayaka (B) Judo (C) Saya (D) Ayaka and Judo
(E) Judo and Saya
25. Aki, Saya, Karate, Haruka, and Judo are standing in a line. Aki is somewhere in front of Judo and behind at least two people. Saya is first in line. How many possible orderings of the five people are there?
- (A) 1 (B) 2 (C) 3 (D) 4 (E) 6



KMMC 2 B

DO NOT OPEN UNTIL SATURDAY, December 3, 2022

****Administration on an earlier date will disqualify your results.****

- All the information is not contained in the non-existent KMMC 2 Teacher's Manual. PLEASE READ THE MANUAL BEFORE SATURDAY, DECEMBER 3, 2022.
- Please don't send the problems to someone else or talk about the problems before the contest is over, as it is cheating.
- Please submit your answers to the Quilgo form if you are taking the five-minute challenge mode.
- To take the traditional, 25-minute test, start the Quilgo and open the test link. You can just close out the Quilgo afterwards without submitting it. Instead, you have 25 minutes to send a private message on AoPS to **DeToasty3**, **pandabearcat**, **PandaMC**, and **pog**.

For more information about the KMMC 2 and our other competitions, please visit
Wait, we don't have a website!

Questions and comments about this competition should be sent to:

DeToasty3, **pandabearcat**, **PandaMC**, and **pog**.

The KMMC 2 contest was written by the KMMC 2 Committee:

DeToasty3, pandabearcat, PandaMC, & pog