



# KMMC 2

Karate Masters Mathematics Competitions 2

1st Annual

# KMMC 2 B

Saturday, January 15, 2022



## INSTRUCTIONS

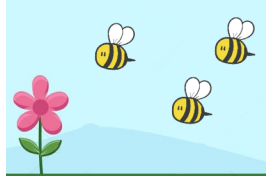
1. Please don't open this booklet until you start the test.
2. This is a twenty-five question multiple choice test. For each question, only one answer choice is correct.
3. Answer the problems by typing your answers on the KMMC 2 Answer Form with a keyboard. Check the keys for accuracy and erase errors 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.

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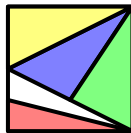
If we find out you cheated, we will remove your score.

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

1. How many bees are in the picture?



- (A) 1    (B) 2    (C) 3    (D) 4    (E) 5
2. Karate has 2 bags of candy, Judo has 5 bags of candy, and Aki has 3 bags of candy. How many bags of candy do they have all together?
- (A) 6    (B) 7    (C) 8    (D) 9    (E) 10
3. How many letters of the word *YUKI* also appear in the word *KARATE*?
- (A) 0    (B) 1    (C) 2    (D) 3    (E) 4
4. Which of these numbers becomes larger when the digits of the number are put in backwards order (from right to left)?
- (A) 7    (B) 42    (C) 65    (D) 78    (E) 121
5. Judo is grilling steak for dinner. He wants the steak to be grilled for at least five minutes, but no longer than seven minutes. Which of these choices is a good number of minutes for Judo to grill his steak?
- (A) 2    (B) 4    (C) 6    (D) 8    (E) 10
6. Haruka has an unfinished square puzzle with a red piece, a yellow piece, a blue piece, and a green piece. Haruka wants to complete her puzzle by using one pink piece. Which of these pink pieces should Haruka use? (Haruka can turn and flip over pieces, but she cannot break them apart.)



- (A)    (B)    (C)    (D)    (E)

7. Which of the following is true about the number 4?
- (A) It is greater than 6.      (B) It is less than 1.      (C) It is equal to  $1 + 3$ .  
(D) It is an odd number.      (E) It is a two-digit number.
8. If Aki has 78 friends including Karate, Judo, and Ayaka, how many friends besides Karate, Judo, and Ayaka does Aki have?
- (A) 74      (B) 75      (C) 76      (D) 77      (E) 78
9. Karate and Judo play a game where each round, either one player wins and the other player loses, or they tie. After seven rounds, Karate won three rounds, and two rounds ended in a tie. How many rounds did Judo lose?
- (A) 1      (B) 2      (C) 3      (D) 4      (E) 5
10. If  $1 + 2 + \square + \triangle = 10$ , what is the value of  $\square + \triangle$ ?
- (A) 3      (B) 4      (C) 5      (D) 6      (E) 7
11. What is the fifth smallest whole number which has at least one 1 as a digit?
- (A) 12      (B) 13      (C) 14      (D) 15      (E) 16
12. Ayaka has four empty bowls. For each bowl, she can put either one or two scoops of ice cream in it. If the four bowls have a combined total of seven scoops in them, how many of the four bowls have two scoops in them?
- (A) 0      (B) 1      (C) 2      (D) 3      (E) 4
13. Aki has a triangle and a square where all of the triangle's and the square's sides have the same length. If Aki glues together a side of the triangle and a side of the square so that they exactly line up and the shapes do not overlap, he will form a new shape. How many sides will this new shape have?



- (A) 5      (B) 6      (C) 7      (D) 8      (E) 9

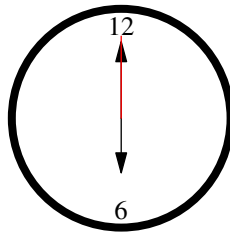
14. What is the value of  $99 + 89 + 1 + 1$ ?

- (A) 150    (B) 160    (C) 170    (D) 180    (E) 190

15. The composers Johann Sebastian Bach and Franz Joseph Haydn share the same birthday, where Bach was born in the year 1685, and Haydn was born in the year 1732. How many years before Haydn was born was Bach born?

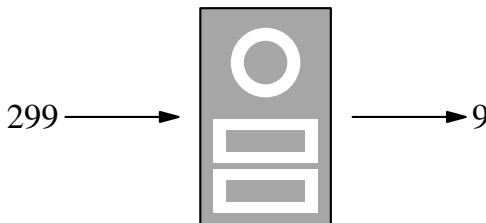
- (A) 41    (B) 43    (C) 45    (D) 47    (E) 49

16. Karate sees an analog clock showing the time 6:00. Karate will then look at the clock for the next 30 minutes. During those 30 minutes, how many times will Karate see the hour hand and the minute hand meet each other?



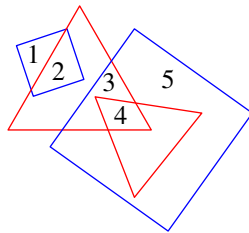
- (A) 0    (B) 1    (C) 2    (D) 29    (E) 30

17. A machine reads the digits of a number and outputs the largest digit that it read. (For example, putting the number 299 into the machine would output the digit 9.) When put into the machine, how many two-digit numbers would output the digit 2?



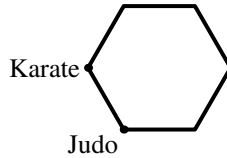
- (A) 0    (B) 1    (C) 2    (D) 3    (E) 4

18. Ayaka is skip-counting by threes and fives. She starts by saying the number 13, then the number 16, then the number 21, then the number 24, and so on, where she switches between going up by three and going up by five with each number. Which number will Ayaka **not** eventually say?
- (A) 29    (B) 32    (C) 37    (D) 42    (E) 45
19. Which of these numbers can be added to each of the numbers 17, 23, and 35 so that all three of the resulting numbers only have even digits?
- (A) 2    (B) 3    (C) 4    (D) 5    (E) 6
20. How many of the five numbers are **not** inside of any red triangles?



- (A) 1    (B) 2    (C) 3    (D) 4    (E) 5
21. In 40 minutes of nonstop work time, Karate can either draw two self-portraits or bake one pie. In 240 minutes of nonstop work time, Karate baked four pies. How many self-portraits did Karate draw during that time?
- (A) 1    (B) 2    (C) 3    (D) 4    (E) 5
22. At recess, Karate sees ten students in line to go down a slide. Judo is the first student in the line. Haruka is somewhere after Judo, but she is not last in the line. Ayaka is somewhere before Haruka and after Judo. What is the largest number of people that can be between Ayaka and Haruka?
- (A) 4    (B) 5    (C) 6    (D) 7    (E) 8
23. On the first Thursday of January, Judo learns that the next issue of his favorite comic series, *Karate the K-Pop Star*, will come out on the fourth Saturday of January. If the first Saturday of January was before the first Thursday of January, how many days will Judo have to wait before the issue comes out?
- (A) 15    (B) 16    (C) 19    (D) 22    (E) 23

24. Karate and Judo each stand at one of the six different corners of a hexagon, but not the same corner. In how many ways can Karate and Judo stand on corners which are next to each other? (One way is shown in the picture.)



- (A) 3      (B) 6      (C) 9      (D) 12      (E) 18
25. Karate tells Judo that his favorite whole number is greater than 7 and less than 12. Judo asks Karate, "Is your number odd?" Karate replies, "No, it is not." Judo can ask one more question to Karate. Which question should Judo ask in order to figure out Karate's favorite number without a doubt?
- (A) Is your number less than 11?      (B) Is your number greater than 10?  
(C) Is your number even?      (D) Does your number end with a 2?  
(E) Does your number have two digits?



# KMMC 2 B

DO NOT OPEN UNTIL SATURDAY, January 15, 2022

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**\*\*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, JANUARY 15, 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**, and **pog**.

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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**, and **pog**.

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

DeToasty3, pandabearcat, & pog