



# KMMC 2

Karate Masters Mathematics Competitions 2

1st Annual

# KMMC 2

Saturday, January 1, 2022



## INSTRUCTIONS

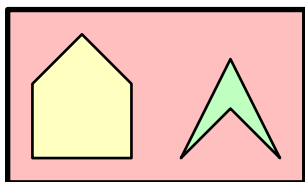
1. Please don't open this booklet until you start the test.
2. This is a twenty-five question multiple choice test. For each question, only one answer choice is correct.
3. Answer the problems by typing your answers on the KMMC 2 Answer Form with a keyboard. Check the keys for accuracy and erase errors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

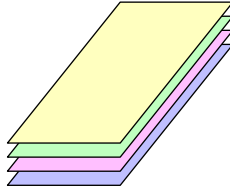
1. If  $5 + \square = 8$ , what is the value of  $\square$ ?  
(A) 2      (B) 3      (C) 6      (D) 8      (E) 13
2. Which of these numbers has the largest tens digit?  
(A) 32      (B) 78      (C) 123      (D) 756      (E) 1048
3. How many letters in the word *KARATE* are vowels?  
(A) 0      (B) 1      (C) 2      (D) 3      (E) 4
4. Exactly two years ago, Karate was 16 years old. How many years old will Karate be exactly four years from now?  
(A) 20      (B) 21      (C) 22      (D) 23      (E) 24
5. What is the number of sides of each of the yellow and green shapes added together?



- (A) 7      (B) 8      (C) 9      (D) 10      (E) 11
6. If the spaces between every two markings next to each other on the ruler are equal in length, what is the value of  $\diamond$ ?
- 
- (A) 4      (B) 6      (C) 8      (D) 10      (E) 12
7. What is the result when the thousands, hundreds, and ones digit of the four-digit number 9716 are added together?
- (A) 19      (B) 20      (C) 21      (D) 22      (E) 23

8. In a race between 10 people, Karate finished first in the race, and Judo finished last in the race. If there were no ties in the race, how many people finished behind Karate but ahead of Judo?
- (A) 7      (B) 8      (C) 9      (D) 10      (E) 11
9. Karate has 58 pencils. Judo then gives him 40 pencils. After Judo gives Karate the pencils, Naruto then takes away 74 of Karate's total pencils. How many pencils does Karate have now?
- (A) 20      (B) 24      (C) 28      (D) 32      (E) 36
10. Haruka is skip-counting by 4. She starts by saying the number 15, then the number 19, then the number 23, and so on. Which of these numbers will she eventually say?
- (A) 30      (B) 31      (C) 32      (D) 33      (E) 34
11. Karate is thinking of a number whose ones digit is 2. How many different numbers from 10 to 100 could Karate be thinking of?
- (A) 9      (B) 10      (C) 11      (D) 12      (E) 13
12. Karate is a fan of the singer Taylor Swift. He has set a goal to listen to 61 minutes and 18 seconds of her song, "All Too Well", every day. If he has already listened to the song for 51 minutes and 5 seconds, how many more minutes and seconds of "All Too Well" does he need to listen to in order to reach his goal?
- (A) 9 minutes, 23 seconds      (B) 9 minutes, 58 seconds  
(C) 10 minutes, 9 seconds      (D) 10 minutes, 13 seconds  
(E) 10 minutes, 23 seconds
13. For all numbers  $\square$  and  $\triangle$ , the value of  $\square \ominus \triangle$  is equal to  $\triangle - \square$ , where  $-$  is the subtraction sign. What is the value of  $3 \ominus 5$ ?
- (A)  $-2$       (B)  $-1$       (C) 0      (D) 1      (E) 2
14. If there are twelve inches in a foot, and there are three feet in a yard, how many inches long is a stick which is a yard and two feet long?
- (A) 24      (B) 36      (C) 48      (D) 60      (E) 72

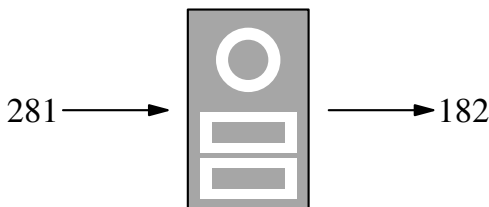
15. Karate has 4 worksheets he needs to do: a math worksheet, a logic worksheet, a reading worksheet, and a science worksheet. He wants to do the math worksheet last, the logic worksheet before the science worksheet, and the reading worksheet after the science worksheet. In what order does Karate have to do the worksheets?



- (A) logic, reading, science, math      (B) math, science, reading, logic  
 (C) science, reading, logic, math      (D) logic, science, reading, math  
 (E) reading, science, math, logic
16. Which of the following is **not** true about a square?



- (A) Squares have four sides.      (B) All sides of a square are equal.  
 (C) Squares are rectangles.      (D) Squares have two lines of symmetry.  
 (E) Squares have more sides than triangles.
17. A machine reads the digits of a number from right to left and outputs what it read. (For example, putting the number 281 into the machine would output the number 182). When put into the machine, which of these numbers would **not** cause the machine to output a valid number?

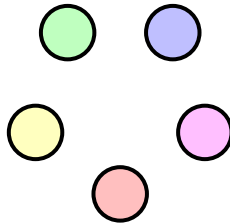


- (A) 0      (B) 37      (C) 64      (D) 121      (E) 140

18. Karate has 20 sheets of paper. He wants to create packets by stapling either two sheets of paper or three sheets of paper together. If Karate makes seven packets with two sheets of paper each, how many packets with three sheets of paper each can Karate make with the sheets of paper left over?

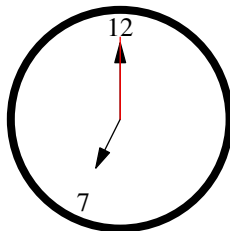
(A) 1      (B) 2      (C) 3      (D) 4      (E) 5

19. Karate has a red, a yellow, a green, a blue, and a pink marble in a bag. He picks a random marble from the bag. What is the chance that he picks the red marble?



(A) 1 in 7      (B) 1 in 6      (C) 1 in 5      (D) 1 in 4      (E) 1 in 3

20. At 7:00, all of the gears of an analog clock stopped working. Karate wants to display 7:30 on the clock. Which of the three hands of the analog clock does Karate have to move?



(A) hour hand only      (B) minute hand only      (C) seconds hand only  
(D) both hour hand and minute hand      (E) all three hands

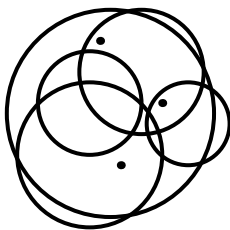
21. Karate is taller than Judo but shorter than Haruka. Naruto is taller than Ayaka but shorter than Judo. Who is the shortest among the five people?

(A) Karate      (B) Judo      (C) Naruto      (D) Haruka      (E) Ayaka

22. A recipe for one bowl of soup calls for 3 carrots, 2 cups of water, and 3 potatoes. If Karate has 9 carrots, 7 cups of water, and 8 potatoes, at most how many bowls of soup can he make?

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

23. How many of the circles have at least one dot inside of them?



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

24. Aki and Judo each have 10 grapes. Aki gives Judo 2 of his grapes. Then, Judo gives Aki 5 of his grapes. Finally, Aki eats 3 of his grapes. Afterwards, who has more grapes, and by how many?

(A) Aki, 1      (B) Aki, 3      (C) Judo, 1      (D) Judo, 3      (E) neither

25. A group of people are standing in a row, including Karate and Judo. Karate is standing somewhere to the right of Judo. As well, there are 7 people standing to the left of Karate, and there are 5 people standing to the right of Judo. If there are 2 people standing in between Karate and Judo, how many people are standing in the row, including Karate and Judo?

(A) 10      (B) 11      (C) 12      (D) 13      (E) 14



# KMMC 2

**DO NOT OPEN UNTIL SATURDAY, January 1, 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, JANUARY 1, 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**.

---

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