

# **pandabearcat's Problems**

**pandabearcat**

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# 1 Introduction

This handout contains every problem which I, (arcade moderator) **pandabearcat**, have proposed which has appeared in a test format, mock or official. Note that this also means that I will not be putting problems here which I posted outside of a contest or are currently not public.

These problems will be listed in chronological order and in the order in which the problems are listed in their respective tests. I will be updating this document as I continue to propose problems.

I have written problems for the following groups:

- Karate Masters Mathematics Competitions (KMMC)
- Karate Masters Mathematics Competitions 2 (KMMC 2)

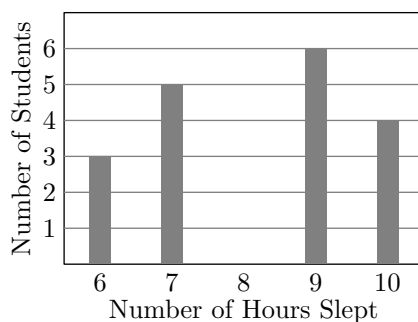
Without further ado, please sit back and enjoy the problems! (and yes, this introduction was a reference to the AoPS user **DeToasty3**, who is writing all of this for me)

## 2 Problems (2021-2022)

1. **(2021 KMMC 8B P4, with DeToasty3)** Aki and Ayaka take a total of eight pictures in which at least one of them appears. If Aki appears in five of the pictures, and Ayaka appears in seven of the pictures, in how many of the pictures do they both appear?

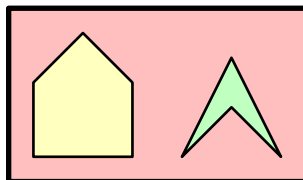
(A) 0      (B) 1      (C) 2      (D) 3      (E) 4

2. **(2021 KMMC 8B P10/9 P8, with DeToasty3)** In a survey, Karate asked the students of his third grade class how many hours of sleep each student got last night. The bar graph below shows the results of Karate's survey. However, the bar representing 8 hours has been mysteriously erased. If the median number of hours slept is 8.5, how many students slept for 8 hours?



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

3. **(2022 KMMC 2A P5, with pog)** 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

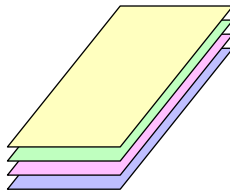
4. **(2022 KMMC 2A P7)** What is the result when the thousands, hundreds, and ones digit of the four-digit number 9716 are added together?

(A) 19      (B) 20      (C) 21      (D) 22      (E) 23

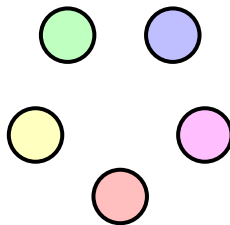
5. **(2022 KMMC 2A P9, with DeToasty3)** Karate has 58 pencils. Judo then gives him 40 pencils. After Judo gives Karate the pencils, Naruto then takes away 74 of Karate's total pencils. How many pencils does Karate have now?

(A) 20      (B) 24      (C) 28      (D) 32      (E) 36

6. (2022 KMMC 2A P11, with pog) 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
7. (2022 KMMC 2A P12) 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
8. (2022 KMMC 2A P15, with pog) 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?

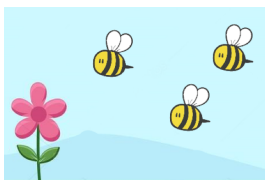


- (A) logic, reading, science, math      (B) math, science, reading, logic  
(C) science, reading, logic, math      (D) logic, science, reading, math  
(E) reading, science, math, logic
9. (2022 KMMC 2A P19, with pog) Karate has a red, a yellow, a green, a blue, and a pink marble in a bag. He picks a 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

10. (2022 KMMC 2B P1, with DeToasty3) How many bees are in the picture?

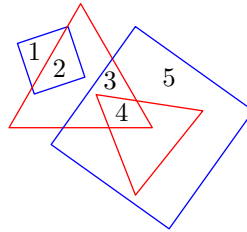


- (A) 1      (B) 2      (C) 3      (D) 4      (E) 5
11. (2022 KMMC 2B P2) Karate has 2 bags of candy, Judo has 5 bags of candy, and Aki has 3 bags of candy. How many bags of candy do they have all together?
- (A) 6      (B) 7      (C) 8      (D) 9      (E) 10
12. (2022 KMMC 2B P8) If Aki has 78 friends 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
13. (2022 KMMC 2B P13, with DeToasty3) 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?

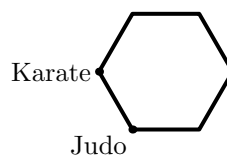


- (A) 5      (B) 6      (C) 7      (D) 8      (E) 9
14. (2022 KMMC 2B P15, with DeToasty3 & pog) The composers Johann Sebastian Bach and Franz Joseph Haydn share the same birthday, where Bach was born in the year 1685, and Haydn was born in the year 1732. How many years before Haydn was born was Bach born?
- (A) 41      (B) 43      (C) 45      (D) 47      (E) 49

15. (2022 KMMC 2B P20, with DeToasty3 & pog) How many of the five numbers are **not** inside of any red triangles?



- (A) 1      (B) 2      (C) 3      (D) 4      (E) 5
16. (2022 KMMC 2B P22) 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
17. (2022 KMMC 2B P23, with DeToasty3) 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
18. (2022 KMMC 2B P24, with pog) 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