Set 1

1. **(4)** Brandon adds 25 mL of sugar to 100 mL of unsweetened coffee. What percent of his coffee is sugar?

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2. **(4)** What is $(2018 + 2018 - 2018 \times 2018) \div 2018$?

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3. **(4)** Juan and Jeff are professional gamers in Clash Royale where you can win, lose, or draw. If Jeff won 30 of the battles, Juan didn't win 57 of the battles, how many games did they draw?

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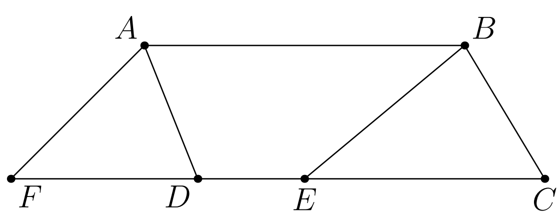
Team: ________________

Set 2

4. **(5)** Two parallelograms, $ABCD$ and $ABEF$, are drawn. It is known that point E lies on $\overline{CD}$, and that the area of the shared region of the two parallelograms is 11. Given that $ABCD$ has area 19, what is the total area covered by the two parallelograms?



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5. **(5)** Josh can speak 10 different languages. Alex can speak 3 different languages, and Michael can only speak 2 different languages. They can all speak English. Let M be the maximum number of different languages the three of them combined could speak, and m be the minimum number of different languages the three of them combined could speak. What is $M + m$?

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6. **(5)** William, Juan, and Huang were bored while writing WinMaC problems, and decide to play a game. First, they each gave themselves an integer score, and played with the rule that if someone writes a good problem, they gain 186 points while the other two people lose 18 points each. If at some point, William, Juan and Huang have scores of 2018, 2002, and 500, then what was the sum of their scores 10 rounds ago?

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Team: ________________

Set 3

7. **(6)** Suppose you have 32 identical balls. 31 of them have the same weight while the other is heavier. You only have a scale to determine which of the 32 balls is the heaviest. What is the minimum number of times you have to weigh a ball or a group of balls on the scale to guarantee that you can find the heavier ball?

8. **(6)** Alex has 18 more stamps in his collection than Michael. After Alex trades $\frac{1}{3}$ of his stamps for $\frac{1}{4}$ of Michael's exotic stamps, they have the same number of stamps. How many stamps do they have in total?

9. **(6)** William thinks of two numbers b and w. He gives Brandon three clues about b and w, and based on these clues, Brandon was able to figure out William's numbers.

   [1] $b + w = 36$

   [2] $b - w$ is a multiple of 6

   [3] w is prime

   What is the product of William's numbers?

Team: ______________________

Set 4

10. **(7)** Compute $2018 - (2017 - (2016 - \ldots - (2 - 1) \ldots))$.

11. **(7)** If a, b, and c are positive integers such that $a \times b \times c = 210$, what is the minimum possible value of $a + b + c$?

12. **(7)** At WinMaC Academy, each student follows a 7 class schedule every day and not everyone have the same schedule. If all classes are the same size, and there is a total of 1001 students, what is least number of teachers needed?

Team: ______________________

Set 5

13. **(8)** What is the average of the answers to question 14 and 15?

14. **(8)** What is the sum of the answers to questions 13 and 15?

15. **(8)** What the the answer to number 13 divided by the answer to number 14?

Team: ______________________

Set 6

16. **(9)** There is a red cube on a flat surface. James wants to surround the red cube with blue cubes of the same size. How many blue cubes would James need so that someone has to remove at least five cubes in order to expose the red cube?

17. **(9)** What is the largest prime factor of $3^8 + 4^4 + 6^4$?

18. **(9)** Find x if $(1 + 2) + (2 + 3) + (3 + 4) + ... + (x + (x + 1)) = 2400$.

Team: ______________________

Set 7

19. **(10)** The ratio of A to B is 3 to 8 and the ratio of B to C is 5 to 11. What is the minimum value of B such that A, B, and C, are all positive integers which sum to a multiple of 33.

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20. **(10)** 12 points are equally spaced on a circle. 3 points are randomly chosen to create a triangle. If the points are indistinguishable, what is the probability that at least one of the angles is $30°$?

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21. **(10)** Let W, I, and N be non-negative integers such that $W + I + N = 18$. What is the probability that $2^W + 2^I + 2^N$ produces an odd number?

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Team: _______________

Set 8

22. **(11)** If n is a natural number, and $7n^2 - 49n + 480$ is divisible by $n - 7$, then what is the largest possible value of n?

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23. **(11)** A lake is in the shape of trapezoid $ABCD$ with $\overline{AB} \parallel \overline{CD}$. Point A has an equal distance of 5 kilometers from points B, C, and D. Kevin and Jason each take a canoe from point A on the shortest route to sides $\overline{BC}$ and $\overline{CD}$ respectively. If they are now 4 kilometers apart, what is the perimeter of the lake?

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24. **(11)** Let x and n be positive real numbers. If $8x + 10 + \frac{2}{x} + n$ has a minimum value of 2018, find n.

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Team: _______________