

## ◦ ✧ Team Round ✧ ◦

30 minutes

**Please put all answers on the provided answer sheet, units are not required**

1. If  $4^x + 21 = 85$  and  $6^y + 3^2 = 45$ , what is  $xy$ ?
2. Wall-E usually leaves his battery on. If his battery is on, but he is not using it, it will last for 24 hours. If he is using it constantly, the battery will only last for 3 hours. Since his last recharge, Wall-E has been on for 9 hours, and during that time he has used energy for 60 minutes. If he continues to leave his battery on, how many more hours will his battery last?
3. A team of 4 people are playing with spinners. Spinner A has 4 equal sections labeled 1-4. Spinner B has 3 equal sections labeled 1-3. On each spinner, the arrow is equally likely to land on each number. What is the probability that the product of the 2 spinners' numbers is even?
4. The average of the 5 numbers in a list is 54. The average of the first 2 numbers is 48. What is the average of the last 3 numbers?
5. What is the largest distance between any two points inside of a regular hexagon with side length 1?
6. A starbase has  $x$  amount of spaceships. When the starbase puts spaceships in rows of 11, there are nine spaceships left over. When the spaceships are put in rows of 9, there are 8 left. When the starbase puts the spaceships in rows of 10, there are two left. What's the minimum amount of spaceships the store can have?
7. A bag contains 4 pieces of paper, each labeled with one of the digits 1,2,3, or 4, with no repeats. Three of these pieces are drawn, one at a time without replacement, to construct a three-digit number. What is the probability that the three-digit number is a multiple of 3?
8. How many numbers between 1 and 100 (inclusive) are multiples of either 3 or 7?
9. How many unique integers are factors of 2024?
10. Write the repeating decimal  $0.20242024\dots$  as a fraction in simplest form