

## Devil Round

Provide interval guesses for the following problems. For each quantity to be estimated, try to give an interval that is as narrow as possible while ensuring that the true value of the quantity still lies within it.

1. The number of undergraduate applicants to Duke in 2020.
2. The sum of the course numbers of all math courses offered at Duke this semester.
3. Total number of physical books in Duke libraries as of 2020.
4. The number of total Duke alumni.
5. The number of views on the 5th most viewed TikTok video ever.
6. The total number of copies of Minecraft sold.
7. The number of characters in the longest city name.
8. Let the number of legal chess positions be  $N$ . Round  $\ln N$  to the nearest integer.
9. The 2021st largest prime.
10.  $\pi^4$ .
11. The unique integer  $n$  such that  $2^n \leq 2021! \leq 2^{n+1}$ .
12.  $12^{12} - 11^{11} + 10^{10} - 9^9 + 8^8 - 7^7 + 6^6 - 5^5 + 4^4 - 3^3 + 2^2 - 1^1$
13. The maximum overall team score earned at this year's Duke Math Meet.