Question 1. Snorlax wants to create a new number system where addition and multiplication works in the same way, but numbers might have different representations. While he was sleeping one day, he dreamt of the following conversions.

Normal Integer	Snorlax Integer
1	1
63	0
1923	5
5280	2
7203	0
43	1
94	3

What is 1739 in Snorlax Integers? Can you find a rule for Snorlax Integers?

Question 2. Ninetails thinks that the last digit of $9^{9^{9^{9^{9^{9^{9^{9^{9}}}}}}}}$ is 9. Is he right? Can you think of a way to answer this question without calculating the number?

Question 3. Are the following numbers even or odd?

(a) 1234×567

(b) $45836 \times 7823 + 89273 \times 9231$

(c) 2^{84}

(d) 17^{429}

(e) $10^{10^{10}}$

(f) $23^{23^{23}}$

(g) $1^1 + 2^2 + 3^3 + \cdots + 9^9 + 10^{10}$

(h) 129!

(i) The 100th Fibonacci number

(j) The 999th triangle number

Question 4. What is the last digit of each of the numbers from question 3?

Question 5. Which of these numbers are divisible by 3?

Question 6. There are 24 Geodudes, 31 Gravelers and 35 Golems in a field. Everytime two different evolutions meet, they fuse together into the third evolution. If you let all of the pokémon roam for long enough, what evolution will be left when all fusing is done?

Question 7. A little known fact is that Dugtrio is a mathematical genius and only speaks in correct solutions to the equation $x^2 + y^2 = z^2$, where x, y and z are integers. Suppose that each of Dugtrio's heads says exactly one number so that the three numbers satisfy the equation above. Is it true that one of these numbers said is divisible by 5?

Question 8. Psyduck, another mathematical prodigy, knows every combination of seven numbers such that the sum of any six of them is divisible by 5. Does Psyduck have a set of seven numbers where at least one of the numbers is not divisible by 5?