

Question 1. *At least how many 8's are needed after 1 to make a number which can be expressed as x^{64} , where x is an integer?*

Proof. $x^{64} = a^2$. Last digit of a^2 belong to $\{0, 1, 4, 5, 6, 9\}$. So we need zero 8's after 1 and $x = 1$. □