

What is the last digit of 3^{4798} ?

A fairly easy one to cap off the semester. Simply looking at the powers of 3 reveals a pattern to the final digits:

$$\begin{aligned}3^1 &= 3 \\3^2 &= 9 \\3^3 &= 27 \\3^4 &= 81 \\3^5 &= 273 \\3^6 &= 729 \\&\dots\end{aligned}$$

The final digits are 3,9,7,1,3,9, etc., repeating every four terms. It only remains to see which of the four digits we 'land' on. Since $4798 = 2 \pmod{4}$, it seems we end up with our second choice, the digit 9.