

(EX)

$$\begin{aligned} 17^{18} \bmod 19 &= (17^2)^9 \bmod 19 = 289^9 \bmod 19 = 4^9 = 4^{2 \cdot 4 + 1} = \\ &= 4 \cdot (4^2)^4 = 4 \cdot (16)^4 = 4 \cdot (16^2)^2 = 4 \cdot 256^2 = \\ &= 4 \cdot 9^2 = 4 \cdot 81 = 4 \cdot 5 = 20 = 1 \bmod 19 \end{aligned}$$

$$289 : 19 = 15$$

$$\begin{array}{r} 19 \\ \overline{) 289} \\ 95 \\ \hline 4 \end{array}$$

$$256 : 19 = 13$$

$$\begin{array}{r} 19 \\ \overline{) 256} \\ 57 \\ \hline 9 \end{array}$$

$$81 : 19 = 4$$

$$\begin{array}{r} 19 \\ \overline{) 81} \\ 76 \\ \hline 5 \end{array}$$