Math 122 In-Class Assignment 11 - Solutions

1. Find x so that $x \equiv (15329)^{100} \pmod 6$ and $0 \leq x < 6$.
2. Find the last digit of 3^{1729}.

Solutions:

1. $(15329)^{100} \equiv (5)^{100} \equiv (-1)^{100} \equiv 1 \pmod 6$
   So $x = 1$.
2. $3^{1729} \equiv 3 \cdot 3^{1728} \equiv 3 \cdot (3^2)^{864} \equiv 3 \cdot (9)^{864} \equiv 3 \cdot (-1)^{864} \equiv 3 \cdot 1 \equiv 3 \pmod{10}$.
   So the last digit of 3^{1729} is 3.