Name: _____

Directions: Show all work. No credit for answers without work.

1. [**5 points**] Use the fast power algorithm to compute $(15)^{101}$ (mod 467). Normalize your answer to a value in $\{0, \ldots, 466\}$.

2. Let p be the prime number 167.

    (a) [**1 point**] How many elements in $\mathbb{Z}_p$ have inverses?

    (b) [**3 points**] Let $a = 105$. Compute enough powers of a to find the order of a in $\mathbb{Z}_p$.

    (c) [**1 point**] Use part (b) to find a^{-1} without additional computation.