

1. State Euler's generalization to Fermat's theorem. Be sure to introduce any notation you use.

Answer: Let  $m$  be a positive integer, and let  $a$  be any integer such that  $(a, m) = 1$ . Then  $a^{\phi(m)} \equiv 1 \pmod{m}$ .

2. State Wilson's theorem.

Answer: Let  $p$  be a prime. Then  $(p-1)! \equiv -1 \pmod{p}$ .