**Homework 9**

**Instructions:** Do as many of the problems as you like, but make sure to complete at least **three**. Then I will create a solution from your work.

1. Is there a primitive root modulo 15? Once you figure this out, check out “Carmichael function” on Wikipedia (this was mentioned earlier as well). Briefly describe what the function is with two-three different examples to clarify the concept.
2. Find a primitive root *g* modulo 50 and express all other primitive roots in terms of *g.*
3. Show that at least one of 2, 3, or 6 is a quadratic residue modulo *p* for
4. Determine if each of 29 and 41 has square-roots modulo 239.
5. Determine the number of primitive roots modulo 491.
6. Suppose *p* is an odd prime. Let *g* be an odd number that is a primitive root modulo Show that *g* is also a primitive root modulo