

# N7 Quadratic MacIntyre

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I have come to realize that the number of quadratic residues has a pattern related to the prime number associated with it. It appears that each prime has exactly  $\frac{P-1}{2}$  amount of residues. I Say P-1 as I don't believe that 0 is included as a quadratic residue when it comes to the prime numbers. Also not included in the lists is the prime number of 2 which is the only even prime. I believe that as 2 is an even prime, it does not follow the same formulas and theorem as the odd primes.

When it comes to whether or not -1 is a quadratic residue for each prime, there appears to be sort of an alternating pattern between true and false. It appears that if you take each prime and compute  $\text{prime}(\text{mod}4)$ , you get 1 for all of the Trues, and a 3 for all of the Falses.

Hence.

$$P = 1(\text{mod}4) = \text{True}$$

$$p = 3(\text{mod}4) = \text{False}$$