

CONGRUENCE CONDITIONS ON PRIMES

There are 46 primes below 200:

2, 3, 5, 7, 11, 13, 17, 19, 23, 29, 31, 37, 41, 43, 47, 53, 59, 61, 67, 71, 73, 79, 83, 89, 97, 101,
103, 107, 109, 113, 127, 131, 137, 139, 149, 151, 157, 163, 167, 173, 179, 181, 191, 193, 197, 199.

Collecting these primes together according to their values modulo 3, 4, 5, 8, and 12, we get the following lists. For example, the primes 7, 13, and 19 all appear in the row marked for 1 mod 3 since they are all congruent to 1 mod 3.

| $a \bmod m$ | $p \equiv a \bmod m, p < 200$ |
|-------------|---|
| 1 mod 3 | 7, 13, 19, 31, 37, 43, 61, 67, 73, 79, 97, 103, 109, 127, 139, 151, 157, 163, 181, 193, 199 |
| 2 mod 3 | 2, 5, 11, 17, 23, 29, 41, 47, 53, 59, 71, 83, 89, 101, 107, 113, 131, 137, 149, 167, 173, 179, 191, 197 |
| 1 mod 4 | 5, 13, 17, 29, 37, 41, 53, 61, 73, 89, 97, 101, 109, 113, 137, 149, 157, 173, 181, 193, 197 |
| 3 mod 4 | 3, 7, 11, 19, 23, 31, 43, 47, 59, 67, 71, 79, 83, 103, 107, 127, 131, 139, 151, 163, 167, 179, 191, 199 |
| 1 mod 5 | 11, 31, 41, 61, 71, 101, 131, 151, 181, 191 |
| 2 mod 5 | 2, 7, 17, 37, 47, 67, 97, 107, 127, 137, 157, 167, 197 |
| 3 mod 5 | 3, 13, 23, 43, 53, 73, 83, 103, 113, 163, 173, 193 |
| 4 mod 5 | 19, 29, 59, 79, 89, 109, 139, 149, 179, 199 |
| 1 mod 8 | 17, 41, 73, 89, 97, 113, 137, 193 |
| 3 mod 8 | 3, 11, 19, 43, 59, 67, 83, 107, 131, 139, 163, 179 |
| 5 mod 8 | 5, 13, 29, 37, 53, 61, 101, 109, 149, 157, 173, 181, 197 |
| 7 mod 8 | 7, 23, 31, 47, 71, 79, 103, 127, 151, 167, 191, 199 |
| 1 mod 12 | 13, 37, 61, 73, 97, 109, 157, 181, 193 |
| 5 mod 12 | 5, 17, 29, 41, 53, 89, 101, 113, 137, 149, 173, 197 |
| 7 mod 12 | 7, 19, 31, 43, 67, 79, 103, 127, 139, 151, 163, 199 |
| 11 mod 12 | 11, 23, 47, 59, 71, 83, 107, 131, 167, 179, 191 |