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> ### A table of the 20 "standard" Jacobi primes to 10^5.mws
  ### i.e. those of the form 27*X^2 + 27*X + 7, the "level 0" Jacobi primes
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All the *standard* Jacobi primes (i.e. $p = 27X^2 + 27X + 7$) up to 10^5:

p	a	b	r	u	$ord_p(r)$	$ord_p(u)$	$ord_p\left(\frac{1}{3}\{p-1\}\right)!$	$ord_p\left(\frac{1}{6}\{p-1\}\right)!$
7	2	1	1	−5	1	(3)	(3)	1
61	−7	2	1	13	1	(3)	(3)	$(2)^2\,(3)$
331	−16	5	1	31	1	(3)	(3)	(2) (3)
547	20	7	1	−41	1	(3)	(3)	(2) (3)
1951	38	13	1	−77	1	(3)	(3)	(3)
2437	−43	14	1	85	1	(3)	(3)	$(2)^2$
3571	−52	17	1	103	1	(3)	1	(2) (3)
4219	56	19	1	−113	1	(3)	1	(2) (3)
7351	74	25	1	−149	1	(3)	(3)	(3)
8269	−79	26	1	157	1	(3)	(3)	$(2)^2\,(3)$
9241	83	28	1	−167	1	(3)	(3)	$(2)^2$
10267	−88	29	1	175	1	(3)	(3)	(2) (3)
13669	101	34	1	−203	1	(3)	1	$(2)^2\,(3)$
23497	−133	44	1	265	1	(3)	(3)	$(2)^2$
25117	137	46	1	−275	1	(3)	1	$(2)^2\,(3)$
55897	−205	68	1	409	1	(3)	1	$(2)^2\,(3)$
60919	−214	71	1	427	1	(3)	(3)	(2) (3)
74419	236	79	1	−473	1	(3)	(3)	1
89269	−259	86	1	517	1	(3)	1	$(2)^2\,(3)$
92401	263	88	1	−527	1	(3)	(3)	$(2)^2$

The following are easily eatablished:

1. If $\left(\frac{1}{3}\{p-1\}\right)! = 1 \pmod p$ then $ord_p\left(\frac{1}{6}\{p-1\}\right)! = 3, 6$ and 12 only, and all possible order-values occur.

In particular, $\left(\frac{1}{3}\{p-1\}\right)!$ and $\left(\frac{1}{6}\{p-1\}\right)!$ are never simultaneously $1 \pmod p$.

2. If $ord_p\left(\frac{1}{3}\{p-1\}\right)! = 3$ then $ord_p\left(\frac{1}{6}\{p-1\}\right)! = 1, 2, 3, 4, 6$ and 12 only, and all possible order-values occur.