

## Teoria de Números Computacional

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folha 6

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1. Verifique se  $x^2 \equiv a \pmod{p}$  tem solução, com

- (a)  $p = 431, a = 5$
- (b)  $p = 419, a = 74$
- (c)  $p = 337, a = 153$
- (d)  $p = 373, a = 177$
- (e)  $p = 463, a = 15$
- (f)  $p = 317, a = 147$
- (g)  $p = 379, a = 195$
- (h)  $p = 397, a = 230$
- (i)  $p = 461, a = 397$
- (j)  $p = 331, a = 184$
- (k)  $p = 467, a = 66$
- (l)  $p = 307, a = 218$
- (m)  $p = 409, a = 203$
- (n)  $p = 449, a = 147$

2. Use o Lema de Gauss para calcular o símbolo de Legendre  $\left(\frac{a}{p}\right)$ , com

- (a)  $a = 2, n = 11$
- (b)  $a = 4, n = 11$
- (c)  $a = 6, n = 43$
- (d)  $a = 8, n = 23$
- (e)  $a = 2, n = 17$
- (f)  $a = 6, n = 13$
- (g)  $a = 5, n = 41$
- (h)  $a = 4, n = 23$
- (i)  $a = 10, n = 13$
- (j)  $a = 8, n = 23$
- (k)  $a = 7, n = 11$
- (l)  $a = 3, n = 37$

(m)  $a = 10, n = 11$

(n)  $a = 10, n = 23$

(o)  $a = 8, n = 29$

(p)  $a = 10, n = 37$

(q)  $a = 5, n = 29$

(r)  $a = 4, n = 41$

(s)  $a = 4, n = 31$

3. Calcule o símbolo de Jacobi  $\left(\frac{a}{n}\right)$ , com

(a)  $a = 275, n = 591$

(b)  $a = 295, n = 591$

(c)  $a = 200, n = 513$

(d)  $a = 214, n = 447$

(e)  $a = 2, n = 295$

(f)  $a = 30, n = 343$

(g)  $a = 124, n = 363$

(h)  $a = 7, n = 589$

(i)  $a = 172, n = 507$

(j)  $a = 129, n = 269$

(k)  $a = 69, n = 281$

(l)  $a = 32, n = 259$

(m)  $a = 92, n = 505$

(n)  $a = 138, n = 331$

(o)  $a = 10, n = 91$

(p)  $a = 178, n = 449$

(q)  $a = 92, n = 205$

(r)  $a = 15, n = 121$

(s)  $a = 203, n = 495$

(t)  $a = 199, n = 423$

(u)  $a = 222, n = 545$

(v)  $a = 23, n = 601$

(w)  $a = 107, n = 397$

(x)  $a = 284, n = 587$

(y)  $a = 5, n = 167$

(z)  $a = 269, n = 571$

4. Verifique se  $n$  passa o teste de Solovay-Strassen na base  $a$ , com

(a)  $n = 679, a = 623$

(b)  $n = 253, a = 115$

(c)  $n = 801, a = 639$

(d)  $n = 867, a = 183$

(e)  $n = 539, a = 413$

(f)  $n = 925, a = 735$

(g)  $n = 747, a = 339$

(h)  $n = 201, a = 111$

(i)  $n = 533, a = 377$