Assignment: Implement Elliptic Curve Algorithms

1. **Find modular square root**
2. **Find order of elliptic curve**
3. **Add points on an elliptic curve (scalar multiplication)**
4. **Find order of a point on an elliptic curve**

Example (for testing/debugging the implementation):

$E : y^2 \equiv x^3 + 7x + 15 \bmod 3571$

Order of elliptic curve $\#E = 3645$

Sample points on the curve:

{6,62}
{6,3509}
{9,1194}
{9,2377}

{11,1285}
{11,2286}
{13,620}
{13,2951}
{14,987}
{14,2584}
{16,475}
{16,3096}

Point multiplication:

150*{16,3096} = {3309, 2985}
173*{14,987} = {1878, 2295}

Order of points:

$\#(\{6,62\}) = 135$
$\#(\{9,2377\}) = 405$
$\#(\{2288, 1585\}) = 1215$