$K \supseteq R = \mathcal{O}_K$

$U = R^* \approx \mathbb{Z}^{r_1+r_2-1} \oplus U_{tor}$ (1)

S-unit group

$U \leq U_S = \{x \in K^* : (x) = \prod_{p_i \in S} p_i^{m_i}\}$.

K.S_unit_group(S=[K.ideal(2)])

(proof=None, S=None)

$\mathbb{Z}[\sqrt{d}]$ $\mathbb{Z}\left[\frac{1+\sqrt{d}}{2}\right]$

$u = a + b\sqrt{d}$

$\pm 1 = u \cdot \bar{u} = (a+b\sqrt{d})(a-b\sqrt{d}) = a^2 - b^2 \cdot d$

$\pm 1 = x^2 - dy^2$

("Pell's equation")

U = K.unit_group()

U.fundamental_units()

$K: x^4 + x + 2016$

$r_1 + 2r_2 = 4$.

For d around a million how big might u be

len(str(___))

4,0 175,598.

2,1

(0,2) 2500

$x^6 + 2$

$\mathbb{Q}(\sqrt{d})$

?

~ 1000-ish

(exponential in bits of input)

Yannick 50,000

Travis 20

$U = \langle u \rangle \times \{\pm 1\}$

$\mathbb{Z}/2 \times \mathbb{Z} \times \mathbb{Z}$

0 1 4 10 50 2016

$x^4 - 5$ — Beraldo 1600 ⟵ !! $r_1 + r_2 - 1 = 2$.

(2,1) Kevin 100

def _latex_(self):

x^3 (3,0) (0,3)