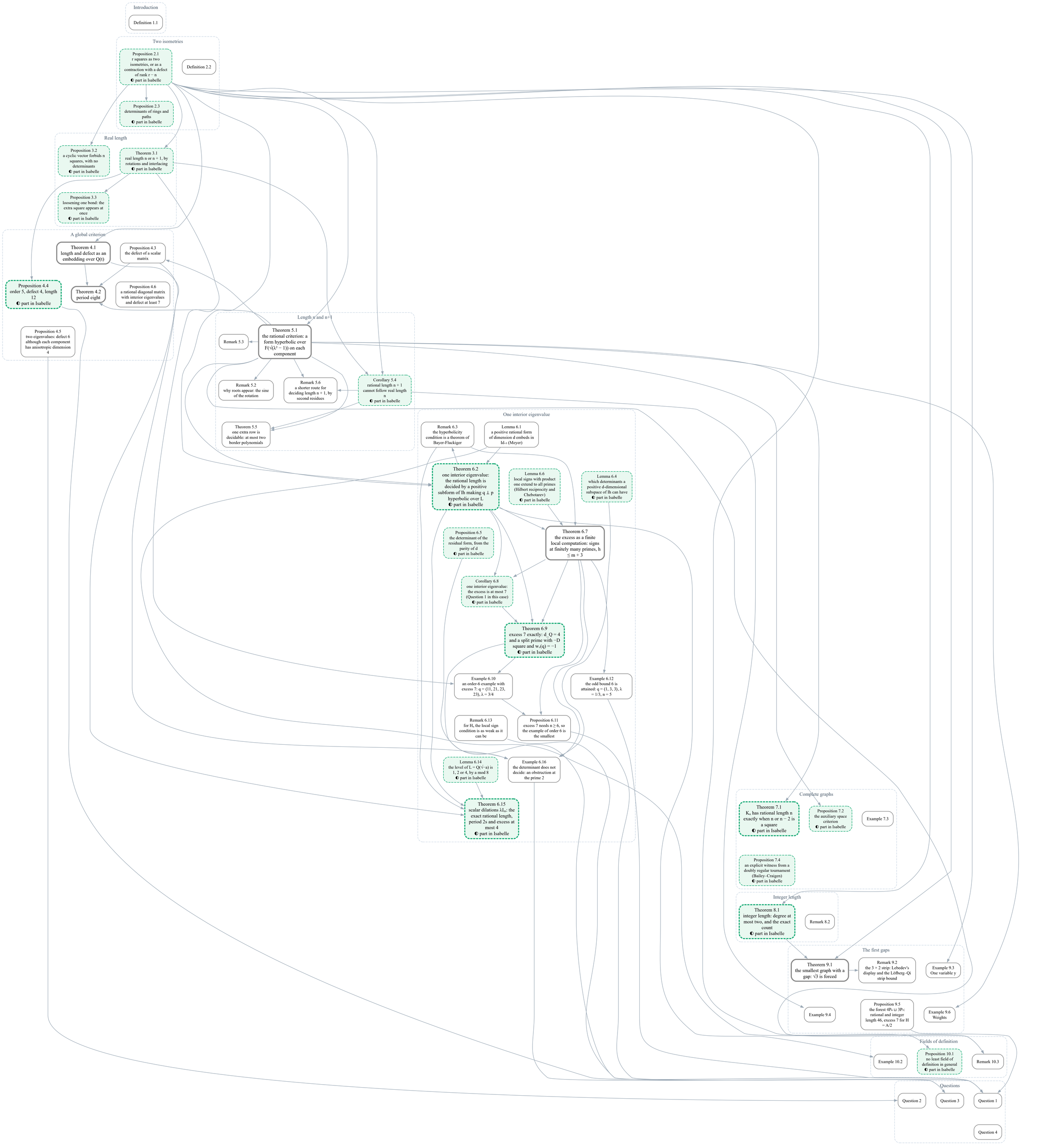
Blueprint

Map of *Rational sums-of-squares lengths of biquadratic forms and orthogonal dilations*

54 results | **0** entirely in Lean | **20** partly in Lean | **0** checked by a program | written proof only | (a result can carry several tags)

Dependencies in the written proof: an arrow A → B means that this proof of B uses A. Every result rests on its written proof; the tags record what was checked besides, and each statement's "Evidence & scope" block says how far. The colour of a box is its strongest tag, in the order above; the tags in the box give the rest. Boxes with a thick border are the main results; click a box to read the statement.



🚀 **Start here: Theorem 8.1**: integer length: degree at most two, and the exact count.

Main results:

- **Theorem 4.1**: length and defect as an embedding over Q(t)
- **Theorem 4.2**: period eight
- **Proposition 4.4**: order 5, defect 4, length 12
- **Theorem 5.1**: the rational criterion: a form hyperbolic over $F(\sqrt{(\lambda^2 - 1)})$ on each component
- **Theorem 6.2**: one interior eigenvalue: the rational length is decided by a positive subform of Ih making $q \perp p$ hyperbolic over L
- **Theorem 6.7**: the excess as a finite local computation: signs at finitely many primes, $h \leq m + 3$
- **Theorem 6.9**: excess 7 exactly: d_Q = 4 and a split prime with −D square and $w_v(q) = -1$
- **Theorem 6.15**: scalar dilations λI_m: the exact rational length, period 2s and excess at most 4
- **Theorem 7.1**: K_n has rational length n exactly when n or n − 2 is a square
- **Theorem 8.1**: integer length: degree at most two, and the exact count
- **Theorem 9.1**: the smallest graph with a gap: $\sqrt{3}$ is forced