

Mathematically Certain (Pure Algebra) Core-Hardening v5: What We Can Say

- ✓ With 6-track class function and $L=17$:
 - Anchors determine exactly 24/97 positions
 - Each position maps to unique (class, slot) pair
 - Need ALL 73 remaining positions for complete solution
 - No algebraic shortcut exists to reduce this
- ✓ Tail coverage under $L=17$:
 - 23-position tail covers 23 unique slots
 - 50 additional positions required beyond tail
 - This is a hard mathematical constraint

Requires Additional Assumptions

- ? Choice of $L=17$:
 - $L=15$ would reduce unknowns to 21 (tail sufficient)
 - $L=20$ would reduce unknowns to 49
 - Why specifically $L=17$? (Not determined by algebra alone)
- ? Tail content:
 - Algebra shows 50 positions beyond tail are needed
 - What determines which 50?
 - Language constraints? Additional structure?
- ? Mechanism families:
 - Mixed Vigenère/Beaufort assumed
 - Other cipher families possible?

Falsifiable Predictions

If $L=17$ is correct:

1. No subset of <73 additional positions can complete solution
2. Any valid completion must specify all 73 missing positions
3. The tail alone leaves exactly 50 positions undetermined

If $L=15$ is correct instead:

1. Only 21 additional positions needed beyond anchors
2. The 23-position tail would be sufficient
3. Two tail positions would be redundant

These predictions can be tested against any proposed solution.