Faster isogenies in a quantum world

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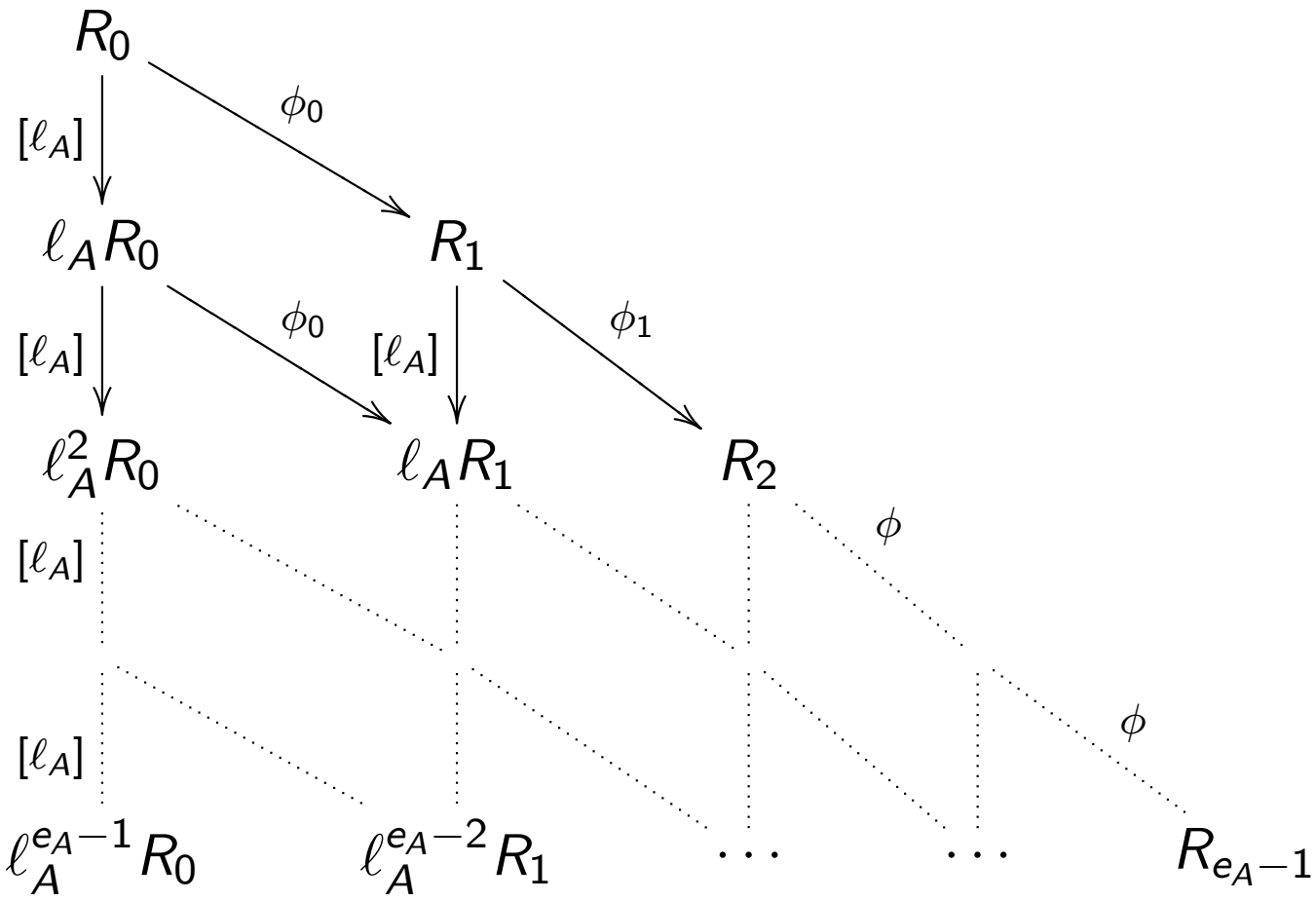
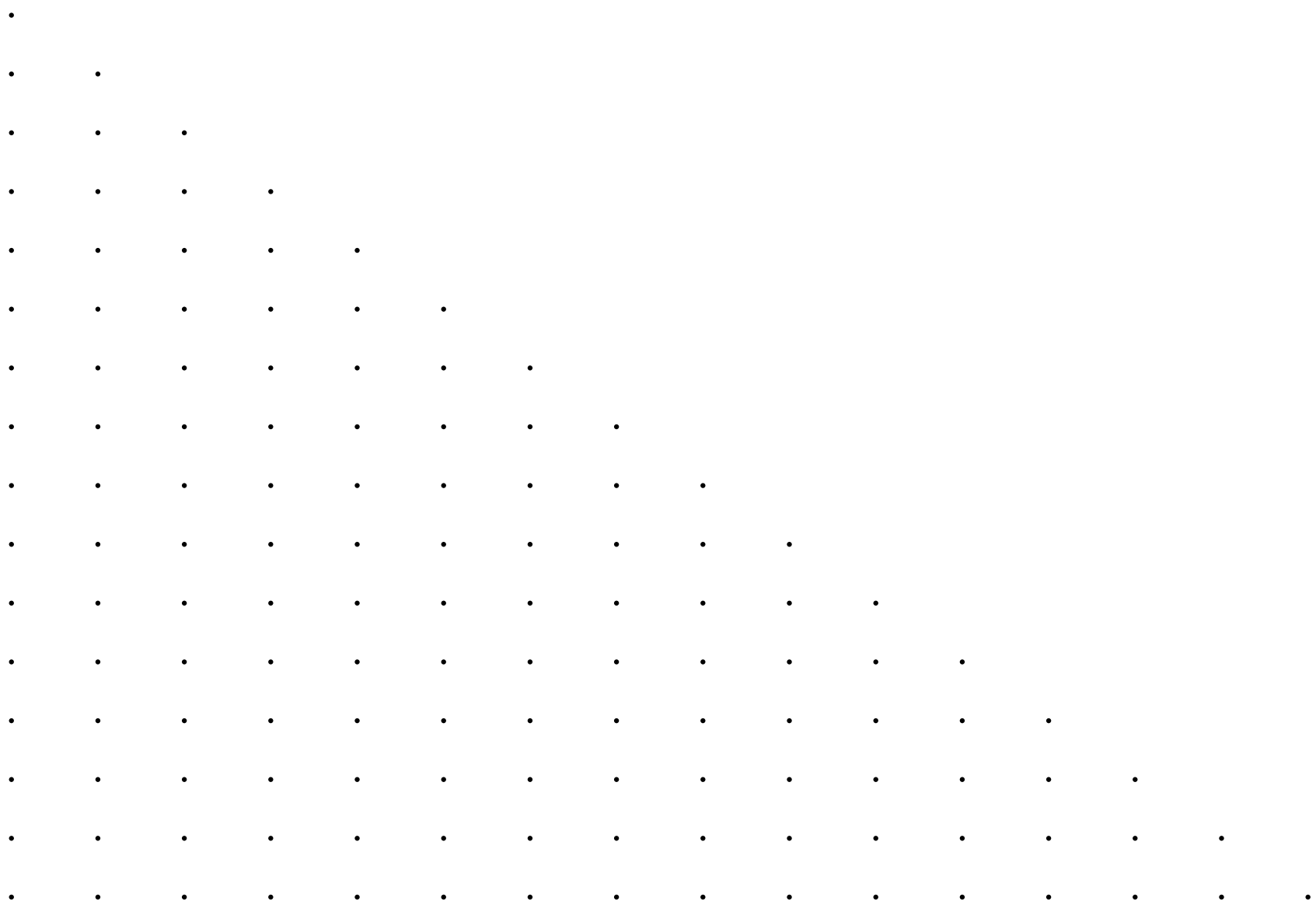
Computational strategies



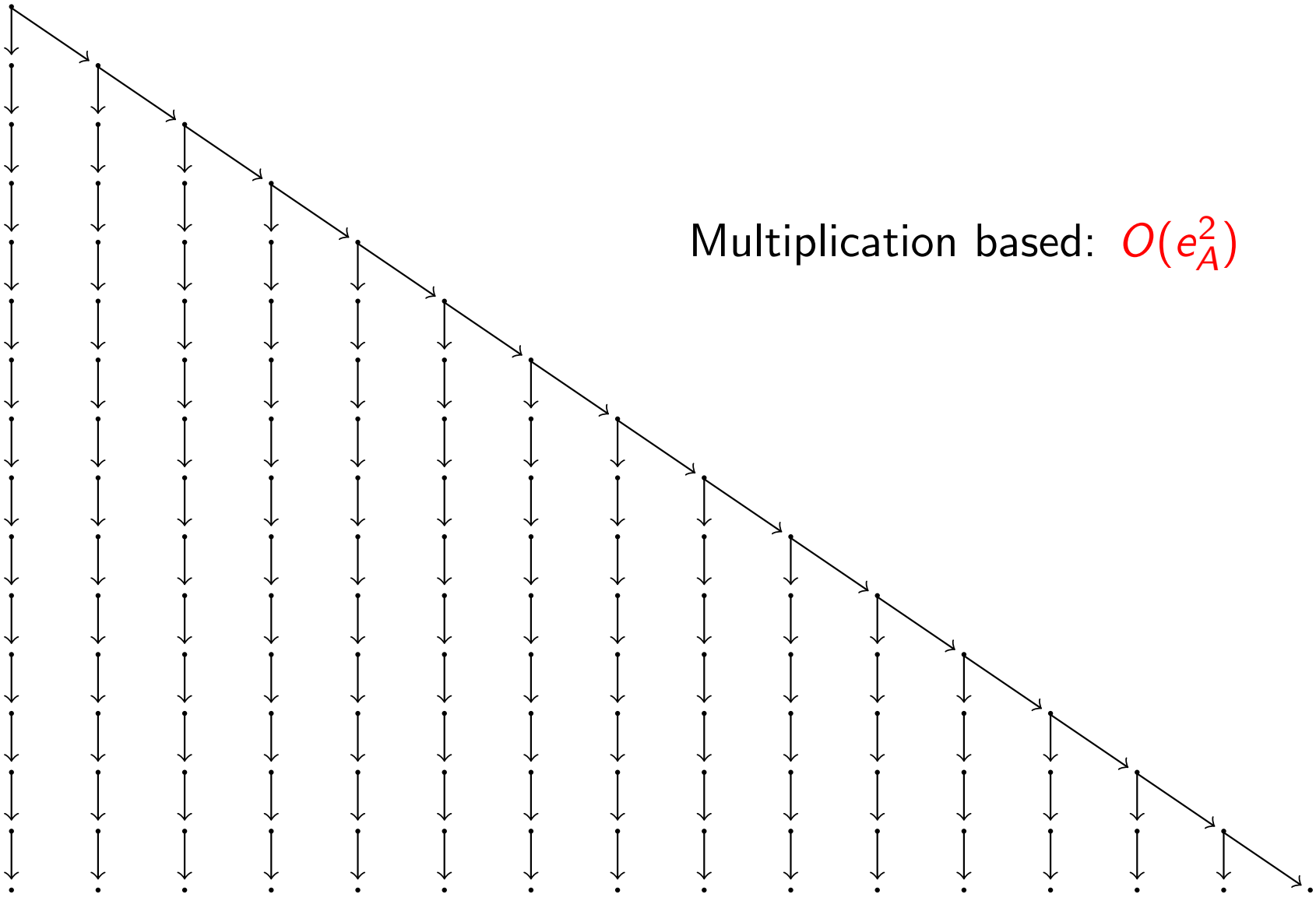
The outer edges are always needed. For the inner nodes, one can:

- Compute *vertical* arrows (multiplication-based strategy)
- Compute *diagonal* arrows (isogeny-based strategy)

Navigating the triangle

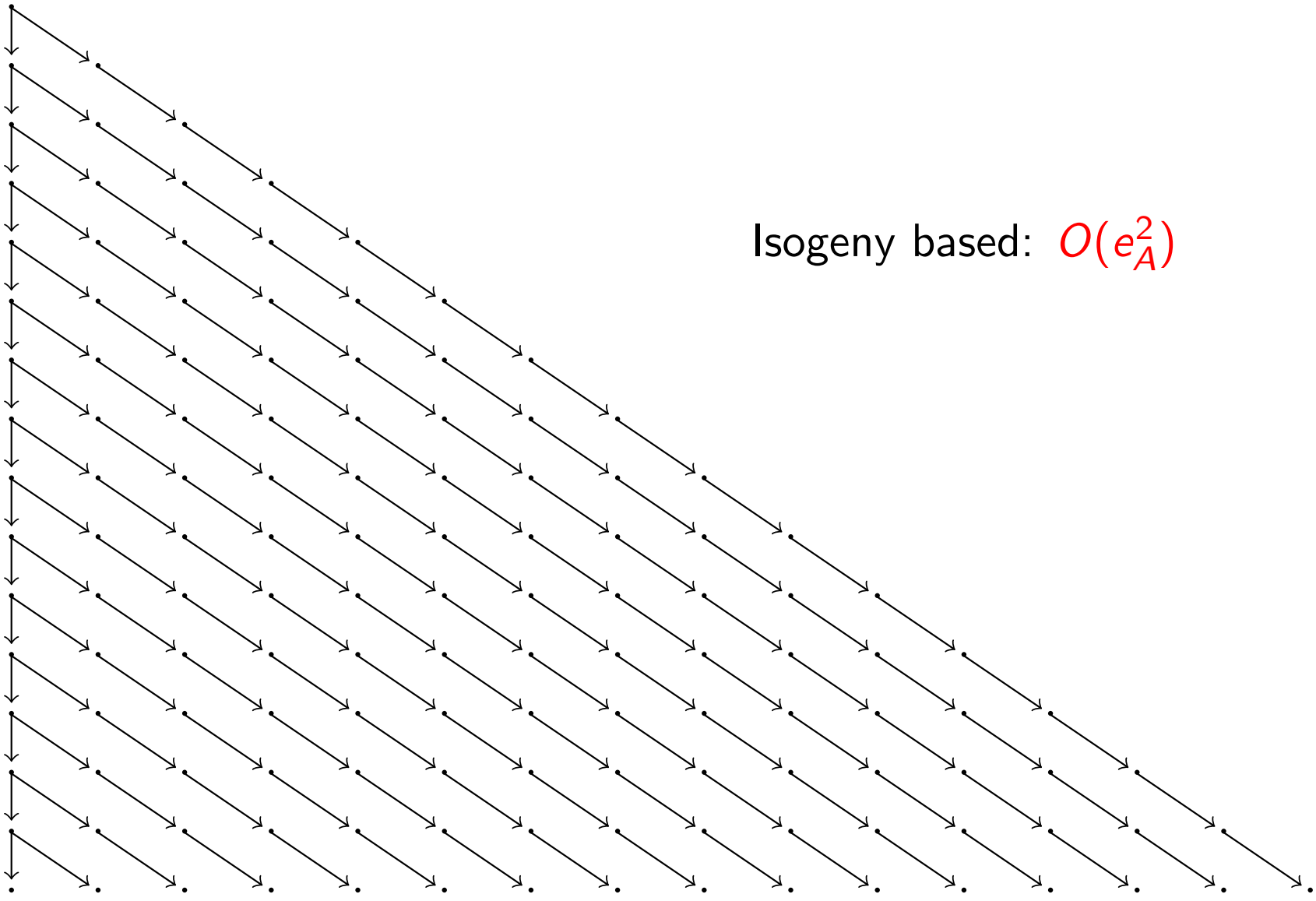


Navigating the triangle



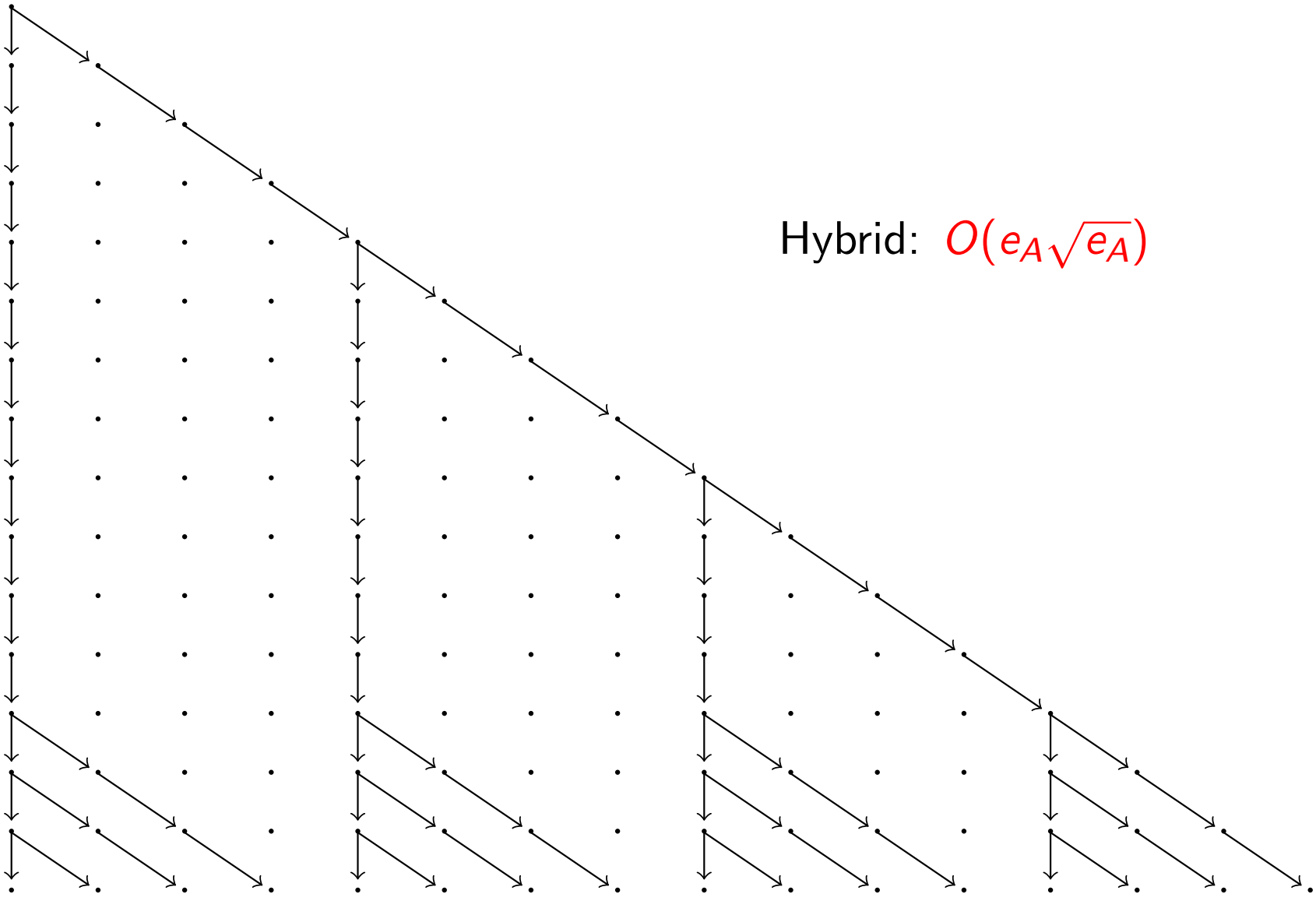
Multiplication based: $O(e_A^2)$

Navigating the triangle



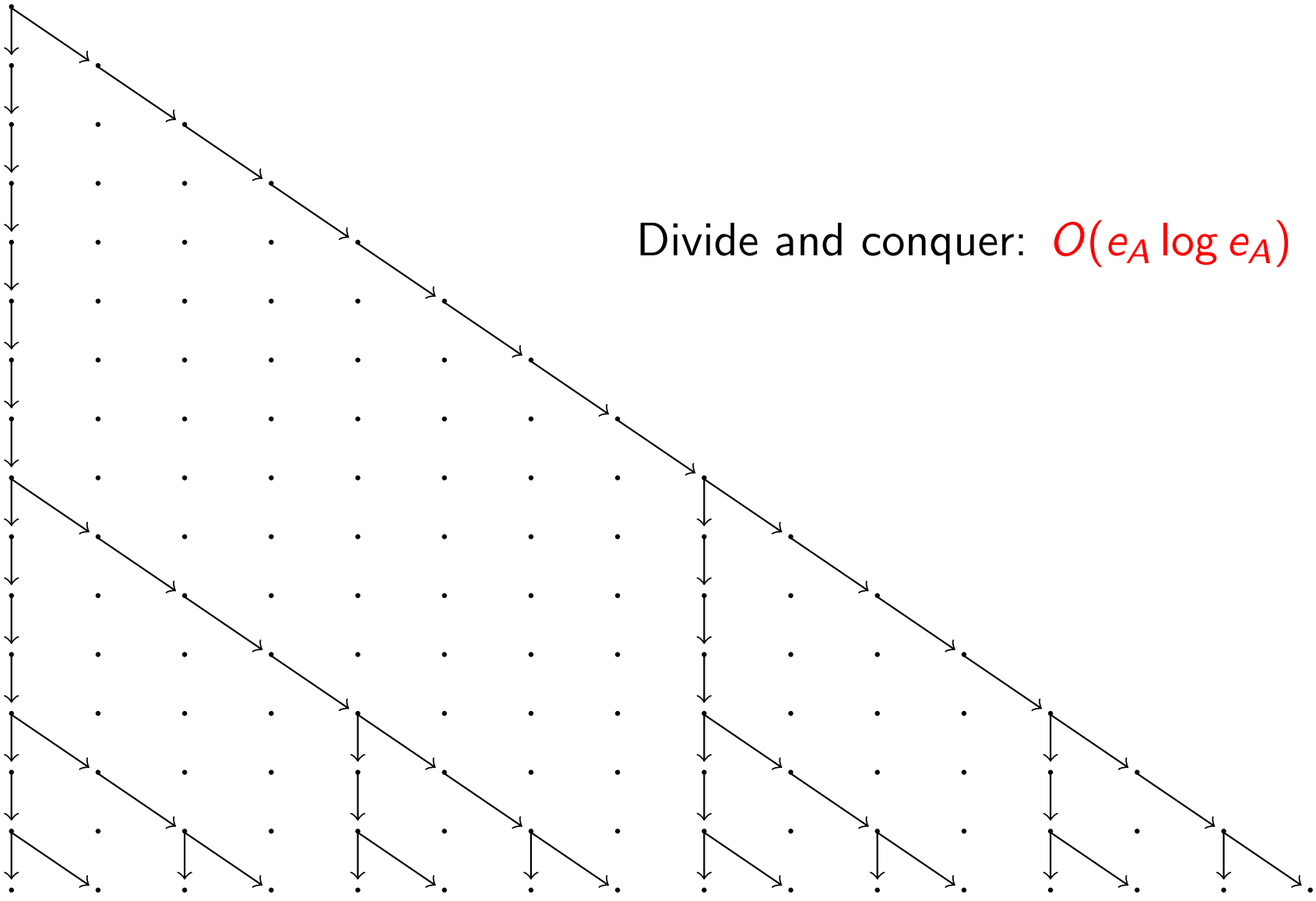
Isogeny based: $O(e_A^2)$

Navigating the triangle



Hybrid: $O(e_A\sqrt{e_A})$

Navigating the triangle



Divide and conquer: $O(e_A \log e_A)$