

Sqrt(x)

We want integer square root ($\lfloor \sqrt{x} \rfloor$) without using pow or floating-point.
We can solve it efficiently using binary search.

Idea:

- The square root of x is in the range $[0, x]$ (actually $[0, x/2 + 1]$ for $x > 1$).
- The binary search:
 - Check $\text{mid} = (l + h) / 2$.
 - If $\text{mid} * \text{mid} \leq x$, move l up (candidate answer).
 - Else, move h down.

Complexity:

- Time: $O(\log x)$ (binary search).
- Space: $O(1)$.

Follow-up:

You could also solve this with Newton's method for faster convergence, but binary search is simplest and safe for integer constraints.