The arithmetic-geometric mean (M(a, b)) of two real numbers (0 < a < b) is called the common limit of two sequences, where one sequence monotonically increases, and the other monotonically decreases: $M(a,b) = \lim_{n\to\infty} a_n = \lim_{n\to\infty} b_n$,

The sequences are defined by recurrence relations:

$$a_0 = a, a_n = \sqrt{a_{n-1} b_{n-1}}, b_0 = b, b_n = \frac{a_{n-1} + b_{n-1}}{2}, n = 1,2,...$$

Compute (M(a, b)) with the maximum possible precision.