Math 325K. Fall 2025
Table for the euclidean algorithm

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The input of this algorithm is a pair of numbers $0 < b < a$. In the method, we will get a sequence of non-negative numbers $r_0, r_1, r_2, \ldots$.

We will consider that the algorithm ends, when one of the elements satisfies $r_{n+1} = 0$. For each $k = 1, \ldots, n$ the sequence will be positive and strictly decreasing

$$r_0 > r_1 > r_2 > \cdots > r_n > 0.$$

We let $r_0 = a$ and $r_1 = b$. In each step, if $r_k > 0$, we let q_k and r_{k+1} be the quotient and remainder that we get when we divide r_{k-1} by r_k. This implies that $0 \leq r_{k+1} < r_k$ and

$$r_{k+1} = r_{k-1} - q_k\, r_k.$$

k	r_{k-1}	r_k	q_k	r_{k+1}
1				
2				
3				
4				
5				
6				
7				
8				