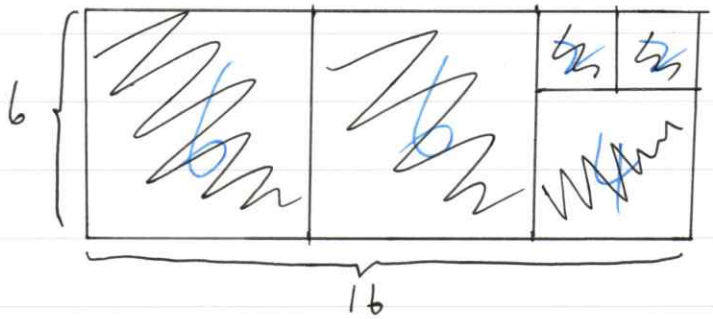
25 05 15

欧几里得演算法 辗转相除法 VII

e.g. $(6, 16) =$



6 6 2 2
4

e.g. $(12921, 4234) = 73$

3	12,921	4,234	19
	12,702	4,161	
3	219	73	
~~3~~	219		
	0		

e.g. (A, B) $\quad A = B \times q + R$

$\Downarrow$

$$\boxed{(A, B) = (B, R)}$$

$$\begin{aligned}(12921, 4234) &= (4234, 219)\\ &= (219, 73)\\ &= \cancel{(73, 0)}\\ &= 73\end{aligned}$$

Proof. $A = Bq + R$ (1)

$\boxed{(A, B) = (B, R)}$ (2)

$\begin{cases} u \to u \\ v \leftarrow v \end{cases}$

① $A = a \cdot u$, $B = b \cdot u$

$$\begin{aligned}R &= A - Bq\\ &= a \cdot u - b \cdot u \cdot q\\ &= u(a - b \cdot q)\\ &= n \cdot u\end{aligned}$$

② $B = b' v$, $R = n' \cdot v$

$$\begin{aligned}A &= b'v + n'v\\ &= (b' + n')v\\ &= a'v\end{aligned}$$