

$$\begin{aligned} 3z + 5l &= 4 \\ z &= \frac{1}{3}(4 - 5l) \end{aligned} \quad \left| \begin{array}{l} z, l \in \mathbb{Z} \\ \text{☀} \end{array} \right.$$

$$\Rightarrow l = 3s + 2$$

$$\Rightarrow 3z + 3 \cdot 5s + 10 = 4$$

$$3(z + 5s) = -6$$

$$\Rightarrow \underline{\underline{(z, l) = (-2 - 5s, 3s + 2)}}$$

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$$b = c \cdot a \quad a | b$$

$$\boxed{3|6} \wedge 6|18$$

$$3|18 \wedge 3|27 \quad 5|(7+15)$$

$$3|(n^2+1)$$

$$\begin{array}{l} n = 3k \\ n = 3k+1 \\ n = 3k+2 \end{array} \Rightarrow \begin{array}{l} n^2+1 = 3 \cdot 3k^2 + 1 \Rightarrow \text{nie} \\ = (3k+1)^2 + 1 = 3 \cdot 3k^2 + 3 \cdot 2k + 2 \\ = (3k+2)^2 = 3 \cdot 3k^2 + 3 \cdot 2 \cdot 2k + 5 \Rightarrow \text{nie} \end{array}$$

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$$n^2 - 1 = (n-1)(n+1)$$

$$\Rightarrow \frac{n^2+1 - (n^2-1)}{2} \quad \uparrow \quad \text{délka } n+1$$

$$\Rightarrow n+1 = 2 \quad \Rightarrow \underline{\underline{n=1}}$$

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$$17 : 4 = ?$$

$$17 = 4 \cdot 4 + 1$$

$$a = qm + r \quad 0 \leq r < m$$

$$a = sm + r \quad b = tm + r$$

$$a \cdot b = (sm+r)(tm+r) = \underbrace{stm^2}_{\uparrow} + \underbrace{(s+t)m}_{\uparrow} + r$$

$$a \cdot b = m \cdot (\dots) + r \cdot q$$

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12	64	gcd(12, 64) = 4
①	①	
②	②	(a, b)
③	④	[a, b]
6	16	
12	32	
	64	

$$\underline{\underline{[12, 64] = 3 \cdot 64}}$$

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$$\text{gcd}(12, 64) = ?$$

$$\boxed{64 = 5 \cdot 12 + 4}$$

$$12 = 3 \cdot 4 + 0$$

$$4 = 64 - 5 \cdot 12$$

$$\begin{array}{l} d|64 \wedge d|12 \\ \Rightarrow d|4 \\ \Rightarrow d|4 \end{array}$$

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$$\begin{aligned} \gcd(10175, 2277) &= 11 \\ 10175 &= 4 \cdot 2277 + 1067 \\ 2277 &= 2 \cdot 1067 + 143 \\ 1067 &= 7 \cdot 143 + 66 \\ 143 &= 2 \cdot 66 + 11 \\ 66 &= 6 \cdot 11 + 0 \end{aligned}$$

$$\begin{aligned} 11 &= 143 - 2 \cdot 66 \\ &= 143 - 2 \cdot (1067 - 7 \cdot 143) \\ &= 15 \cdot 143 - 2 \cdot 1067 \\ &= 15 \cdot (2277 - 2 \cdot 1067) - 2 \cdot 1067 \\ &= -32 \cdot 1067 + 15 \cdot 2277 \\ &= -32(10175 - 4 \cdot 2277) + 15 \cdot 2277 \\ &= (-32) \cdot 10175 + (153) \cdot 2277 \end{aligned}$$

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$$\begin{aligned} a_1 &= r_1^{b_1} \cdot \dots \cdot r_k^{b_k} & 12 &= 2^2 \cdot 3 & (2, 6) &= 2 \\ b_1 &= q_1^c \cdot \dots \cdot q_e^c & 6 &= 2 \cdot 3 & [2, 6] &= 3 \cdot 6 \end{aligned}$$

a^2 máť byť deliteľ 4, zvyšok 0, 1

a sudé: $a = 2k$ $a^2 = 4k^2 \Rightarrow$ zvyšok 0

k liché: $a = 2k+1$ $a^2 = 4k^2 + 4k + 1 \Rightarrow$ zvyšok 1

a^2 je deliteľ 8? $[0, 4]$

k liché: $a^2 = 4k^2 + 4k + 1 = 4 \cdot k(k+1) + 1$

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