1. HF

1.3 $\text{lnko}(504, 150)$

$504 = 3 \cdot 150 + 54$

$150 = 2 \cdot 54 + 42$

$54 = 1 \cdot 42 + 12$

$42 = 3 \cdot 12 + 6$

$12 = 2 \cdot 6 + 0$

2.4

$11 \equiv 8 \ (3)$

$n \mid a - b$

$3 \mid 11 - 8$

$3 \mid 3$

igen

3.3

$16x \equiv 36 \ (28)$

$28 \mid 16x - 36$

$28 \mid 4(4x - 9)$

$7 \mid 4x - 9$

$7 \mid 4x - 9$

$4x - 9 = 7$

$x = 4$ ✓

1 van megoldása

V.

$\text{lnko}(16, 28) \mid 36$

$28 = 1 \cdot 16 + 12$

$16 = 1 \cdot 12 + 4$

$12 = 4 \cdot 3 + 0$

4 | 36 ✓ 1 van megoldás

4.5.6.

$x \cdot 3 + y \cdot 4 = 40$

1. $\text{lnko}(3,4) \mid 40 \quad = 1 \mid 40$ ✓

2. $3x = 40 - 4y \ / \ \text{mod } 4$

$3x \bmod 4 = (40 - 4y) \bmod 4$

$-4y \bmod 4 = 0$

$3x \bmod 4 = 40 \bmod 4$

$3x \equiv 40 \ (4)$

3. $3x \equiv 40 \ (4) \ / + 4 \ / + 4$

$3x \equiv 48 \ (4) \quad / \ 3$

$x \equiv 12 \ (4)$ (4 = lnko(4,3))

$x \equiv 12 \ (4)$

$x \in (12 + 4k \mid k \in \mathbb{Z})$

2. $16x \equiv 36 \ (28) \ / - 28$

$16x \equiv 64 \ (28) \quad / 16$

$x \equiv 4 \ \left(\frac{28}{\text{lnko}(28,16)}\right)$ (4)

$x \equiv 4 \ (7)$

$x \in \{4 + 7k \mid k \in \mathbb{Z}\}$

$\{4 + k_1 \mid 28 \mid\} \cup (-10 \le 28\}$

$\{25 + 28k_2\} \cup \{11 + k_1 28\}$

$\{-17, -10, -3, 4, 11, 18, 25, 32\}$

$3x + 4y = 40$

mert $\cdot 4$-ekkel

$3 \cdot (4k_1 + 4y) = 10$

$y = 10 - 3k \quad (k \in \mathbb{Z})$

$x, y \geq 0 \in \mathbb{Z}$

$4k \geq 0 \Leftrightarrow \underline{k \geq 0} = k_1$

$10 - 3k \geq 0 \Leftrightarrow \underline{k \leq \frac{10}{3}} \; k_2$

$k \in k_1 \wedge k_2 \Rightarrow 0 \leq k \leq \frac{10}{3} =$

$\Rightarrow \underline{\underline{k \in \{0, 1, 2, 3\}}}$

~~$k \in$~~

7.3

$9x \equiv 3 \; (6)$

$5x \equiv -1 \; (3)$ (kelyett 7 hogy legyen értelme)

$-x \equiv 4 \; (5)$

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① Kínai maradéktétel

$\text{lnko}(6,3) = 1 \Rightarrow$ nem lélegzik nincs megoldás

$\text{lnko}(6,5) = 1$ kell hogy

$\text{lnko}(5,3) = 1$

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② $c_1 = 3 \quad m_1 = 6$

$c_2 = -1 \quad m_2 = 7$

$c_3 = 4 \quad m_3 = 5$

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③ $M = m_1 \cdot m_2 \cdot m_3 = 6 \cdot 7 \cdot 5 = 210$

$M_1 = M/m_1 = 210/6 = 35 = 7 \cdot 5$

$M_2 = M/m_2 = 210/7 = 30$

$M_3 = M/m_3 = 210/5 = 42$

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④ $\boxed{M_i \cdot y \equiv 1 \; (m_i)}$

$35y \equiv 1 \; (6) \Rightarrow y_1 \equiv -1 \; (6)$

$30y \equiv 1 \; (7) \Rightarrow y_2 \equiv 4 \; (7)$

$42y \equiv 1 \; (5) \Rightarrow y_3 \equiv 3 \; (5)$

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⑤ $\boxed{X \equiv c_i \cdot M_i \cdot y_i \; (M)}$

$X \equiv 3 \cdot 35 \cdot (-1) + (-1) \cdot 30 \cdot 4 + 4 \cdot 42 \cdot 3 \; (210)$

$X \equiv 279 \; (210)$

$\boxed{X \equiv 69 \; (210)}$