$$\begin{cases} \text{inv}(2^k) = 2\cdot\text{inv}(2^{k-1}) + 10\cdot\text{str}(2^{k-1}) + 4\cdot\text{sum}(2^{k-1}) + 1, & k \geq 2 \\ \text{inv}(2^0) = \text{inv}(1) = 1 \\ \text{inv}(2^1) = 2\cdot\text{inv}(2^0) + 10\cdot\text{str}(2^0) + 4\cdot\text{sum}(2^0) + 1 = 17 \end{cases}$$

$$\begin{cases} \text{str}(2^k) = \frac{23}{5}\cdot 7^k - \frac{18}{5}\cdot 2^k, & k \geq 1 \\ \text{str}(2^0) = \text{str}(1) = 1 \end{cases}$$

$$\text{sum}(2^k) = (2^k)^2 = 4^k$$

dla $k \geq 2$:

$$\begin{aligned} \text{inv}(2^k) &= 2\cdot\text{inv}(2^{k-1}) + 10\cdot\text{str}(2^{k-1}) + 4\cdot\text{sum}(2^{k-1}) + 1 = \\ &= 2\cdot\text{inv}(2^{k-1}) + 10\left(\frac{23}{5}\cdot 7^{k-1} - \frac{18}{5}\cdot 2^{k-1}\right) + 4\cdot 4^{k-1} + 1 = \\ &= 2\cdot\text{inv}(2^{k-1}) + 46\cdot 7^{k-1} + 4\cdot 4^{k-1} - 36\cdot 2^{k-1} + 1 \end{aligned}$$

Niech $r(k) = 46\cdot 7^k + 4\cdot 4^k - 36\cdot 2^k + 1, \quad k \geq 1$

$$\begin{aligned} \text{inv}(2^k) &= 2\cdot\text{inv}(2^{k-1}) + r(k-1) = \\ &= 2\cdot(2\cdot\text{inv}(2^{k-2}) + r(k-2)) + r(k-1) = \\ &= 2\cdot(2\cdot(2\cdot\text{inv}(2^{k-3}) + r(k-3)) + r(k-2)) + r(k-1) = \\ &= 2\cdot(2\cdot(2\cdot \ldots \text{inv}(2^1) + r(1) \ldots) + r(k-2)) + r(k-1) = \\ &= 2^{k-1}\cdot\text{inv}(1) + 2^{k-2}\cdot r(1) + 2^{k-3}\cdot r(2) + \ldots + 2^1\cdot r(k-2) + 2^0\cdot r(k-1) = \\ &= 17\cdot 2^{k-1} + \sum_{i=2}^{k} 2^{k-i}\cdot r(i-1) \end{aligned}$$

Zatem ostatecznie:

$$\begin{cases} \text{inv}(2^0) = 1, \\ \text{inv}(2^1) = 17 \\ \text{inv}(2^k) = 17\cdot 2^{k-1} + \sum_{i=2}^{k} 2^{k-1}\cdot r(i-1), & k \geq 2 \end{cases}$$

gdzie $r(i) = 46\cdot 7^k + 4\cdot 4^k - 36\cdot 2^k + 1, \quad k \geq 1$