

1084 c. Dokazati da je za sve prirodne brojeve $n \geq 0$: $19 \mid 7 \cdot 5^{2n} + 12 \cdot 6^n$.

Za $n = 1$

$$19 \mid 7 \cdot 5^{2n} + 12 \cdot 6^n$$

$$19 \mid 7 \cdot 5^2 + 12 \cdot 6^1$$

$$19 \mid 7 \cdot 25 + 12 \cdot 6$$

$$19 \mid 247$$

Pretpostavka da za $n = k$, $19 \mid 7 \cdot 5^{2k} + 12 \cdot 6^k$

Za $n = k+1$

$$19 \mid 7 \cdot 5^{2(k+1)} + 12 \cdot 6^{k+1}$$

$$19 \mid 7 \cdot 5^{2k+2} + 12 \cdot 6^{k+1}$$

$$19 \mid 25 \cdot 7 \cdot 5^{2k+2} + 6 \cdot 12 \cdot 6^{k+1}$$

$$19 \mid 25 \cdot 7 \cdot 5^{2k} + 6 \cdot 12 \cdot 6^k + 19 \cdot 6^k - 19 \cdot 6^k$$

$$19 \mid 25 \cdot 7 \cdot 5^{2k} + 25 \cdot 12 \cdot 6^k - 19 \cdot 6^k$$

$$19 \mid 25 \cdot (7 \cdot 5^{2k} + 12 \cdot 6^k) - 19 \cdot 6^k$$

$$19 \mid 25 \cdot (7 \cdot 5^{2k} + 12 \cdot 6^k) \wedge 19 \mid 19 \cdot 6^k$$
