Zadatak 38. Koliko je $\sqrt{44\ldots4+11\ldots1-66\ldots6}$, pri čemu prvi broj ima $2n$ znamenki, drugi $n+1$, a treći n, $n\geqslant 3$?

Rješenje.

$$\begin{aligned}
\sqrt{\underbrace{44\ldots4}_{2n}+\underbrace{11\ldots1}_{n+1}-\underbrace{66\ldots6}_{n}} &= \sqrt{\frac{4}{9}(10^{2n}-1)+\frac{1}{9}(10^{n+1}-1)-\frac{6}{9}(10^{n}-1)}\\
&= \sqrt{\frac{4}{9}10^{2n}-\frac{4}{9}+\frac{1}{9}10^{n+1}-\frac{1}{9}-\frac{6}{9}10^{n}+\frac{6}{9}}\\
&= \sqrt{\frac{4}{9}10^{2n}+\frac{10}{9}10^{n}-\frac{6}{9}10^{n}+\frac{1}{9}}\\
&= \sqrt{\frac{4}{9}10^{2n}+\frac{4}{9}10^{n}+\frac{1}{9}} = \sqrt{\left(\frac{2}{3}10^{n}+\frac{1}{3}\right)^{2}}\\
&= \frac{2}{3}10^{n}+\frac{1}{3} = \frac{6}{9}(10^{n}-1)+\frac{6}{9}+\frac{1}{3}\\
&= \underbrace{66\ldots6}_{n}+1 = \underbrace{66\ldots6}_{n-1}7.
\end{aligned}$$