Factorize 7961 using the continued fractions method.

Let $b_{-1} = 1, b_0 = a_0 = \lceil \sqrt{n} \rceil = 89, x_0 = \sqrt{n} - a_0 = 0.224436...$

i	0	1	2	3	4	5	6	7	8	9
a_i	89	4	2	5	7	1	1	2	1	5
b_i	89	357	803	4372	7524	3935	3498	2970	6468	3466
$b_i^2 \mod n$	-40	73	-32	23	-95	80	-53	112	-31	7

We choose the factor base B as $B = \{-1, 2, 5, 7\}$. Then $b_i^2 \mod n$ is a B-number for $i = 0, 2, 5, 7, 9$. The associated vectors α_i are:

$$\alpha_0 = (1, 3, 1, 0), \alpha_2 = (1, 5, 0, 0), \alpha_5 = (0, 4, 1, 0), \alpha_7 = (0, 4, 0, 1), \alpha_9 = (0, 0, 0, 1)$$

$\alpha_7 + \alpha_9 = 0(\mod 2)$

$b = b_7 \cdot b_7 = 2970 \cdot 3466 \mod 7961 = 447$

$c = 2^2 \cdot 7 = 28$

Because $b \neq \pm c$, $(b + c, n) = (475, 7961) = 19$ is a factor of n.

So, $n = 19 \cdot 419$