\[
U_p \equiv 5 \left(\frac{p-1}{2}\right) \equiv \epsilon_p \pmod{p} \\
V_p \equiv 1 \pmod{p}
\]

Hence \( m = U_{2p} \equiv \epsilon_p \pmod{p} \) and, since \( U_{2p} \) is odd, \( 2p \) divides \( m - \epsilon_p \), hence \( U_{2p} \) divides \( U_{m-\epsilon_p} \). It remains to show that \( \epsilon_m = \epsilon_p \) or that \( m \equiv p \pmod{10} \). Taking (3) modulo 5 we have

\[4^{p-1} U_p V_p \equiv (-1)^{p-1} U_{2p} = U_{2p} \equiv p \pmod{5}, \] and

since \( m = U_{2p} \) and \( p \) are both odd \((p \neq 3)\) we have \( m = p \pmod{10} \) or \( \epsilon_p = \epsilon_m \) and the result follows.

\[\text{XXXXX} \]

**TWO VERY SPECIAL NUMBERS**

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Stimulated by my derivation of the two 17-digit automorphic numbers (Recreational Mathematics Magazine, No. 14), Mr. R. A. Fairbairn of Willowdale, Ontario, has derived the two 100-digit automorphics.

The labor involved in this tremendous task would deter most enthusiasts, since the results were achieved (and of course checked) using no help other than a simple desk adding machine.

An automorphic number is distinguished by having its square end with the number itself.

The two 100-digit automorphic numbers, never before published so far as I know, are:

\[
3, 953, 007, 319, 108, 169, 802, 938, 509, 890, 062, 166, \\
509, 580, 863, 811, 000, 557, 423, 423, 230, 896, 109, \\
004, 106, 619, 977, 392, 256, 259, 918, 212, 890, 625 \\
\]

and

\[
6, 046, 992, 680, 891, 830, 197, 061, 490, 109, 937, 833, \\
490, 419, 136, 188, 999, 442, 576, 576, 769, 103, 890, \\
995, 893, 380, 022, 607, 743, 740, 081, 787, 109, 376
\]