

Problem of the Week-4: Last Digits of Squares

For any positive integer n in base 10, we know that n^2 ends with 0 (the units digit is 0) if and only if n itself ends with 0. Now consider numbers written in base b , where $5 \leq b \leq 9$. Determine for which bases b (if any) the following statement is true.

For any positive integer n , n^2 ends with 0 if and only if n ends with 0.

As always, prove your answer.

Posting Date 2/21/13. Submit solutions to Noah Aydin, Mathematics Department, RBH 319 (e-mail or hard-copy, but hard copy submissions must include a time stamp) by 4 pm on 3/1/13 (extended until 3/21).