



LEWIS AND CLARK COLLEGE
Department of Mathematical Sciences

SOLUTION OF THE PUZZLE OF THE WEEK
(8/31/2016 - 9/6/2016)

Problem: How many of the integers

1, 11, 111, 1111, 11111, ...

are perfect squares? (By a perfect square we mean a square of an integer.)

Solution: Only 1 is a perfect square.

To see this observe that all the remaining numbers in the sequence leave the remainder 3 after division by 4:

$$11\dots 11 \equiv 11 \equiv 3 \pmod{4}.$$

Since squares of integers only take the forms of $4k$ or $4k + 1$ there are no perfect squares which leave the remainder 3 after division by 4. Thus, 1 is the only perfect square in the list.