## PROBLEM OF THE WEEK Solution of Problem No. 1 (Fall 2003 Series)

**Problem:** Determine the integer n with the properties:

a) n is a prime less than 6000,

b) the number formed by the last two digits of n is < 10, and

c) if the decimal digits of n are reversed to obtain N, then N - n = 999.

Solution (by Troy Siemens, Asst. Prof. Math & CS, Virginia Military Institute)

Write n = a \* 1000 + b \* 100 + c \* 10 + d with  $1 \le a \le 5$  and  $0 \le b, c, d \le 9$ . By b), c = 0. Also, N - n = (d - a) \* 999 - b \* 90 = 999. This forces b = 0 and d = a + 1. The only such numbers are 1002, 2003, 3004, 4005, and 5006, of which only 2003 is prime. Hence, solution is n = 2003.

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