Math 55: Homework 5

Due Thursday, July 9

1. Express the following using sum and product notation:

$$1 + (2 \cdot 3) + (3 \cdot 4 \cdot 5) + (4 \cdot 5 \cdot 6 \cdot 7) + \ldots + (8 \cdot 9 \cdot 10 \cdot 11 \cdot 12 \cdot 13 \cdot 14 \cdot 15)$$

2. Show that a number n is divisible by 4 if and only if one of these two cases holds: (1) the tens digit is even and the ones digit is divisible by 4, or (2) the tens digit is odd and the ones digit is equivalent to 2 (mod 4).

3. Show that 2034956098435602302 is not a perfect square. Your proof should not involve multiplying any large numbers.

4. What are the last two digits of 341899^{100}?