Quiz 5, Discrete Math (15 points), Fall 2016
The quiz is 20 minutes. Show your work and justify your answers where appropriate. If you write the correct answer without sufficient work or justification, you will receive little or no credit.

1. (1 point each) Clearly circle your answer (no justification needed here, and no partial credit given).
   (a) The digits $a_1, a_2, \ldots, a_{10}$ of an ISBN are chosen so that $a_1 + 2a_2 + 3a_3 + \cdots + 9a_9 + 10a_{10} \equiv 0 \pmod{11}$.
   TRUE   FALSE

   (b) Suppose I attempt to copy my textbook’s valid ISBN, but I accidentally type two of its digits incorrectly. Is it possible that the result is a valid ISBN? YES NO

2. (3 points) Find all integers $x$ satisfying $0 \leq x < 30$ and $2x \equiv 4 \pmod{30}$.

3. (4 points) The number 977 is prime. Find $2^{979} \pmod{977}$. 
4. (6 points) Use the techniques of section 4.5 to find the smallest positive integer $x$ satisfying

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x \equiv 1 \pmod{7}
\]

\[
x \equiv 2 \pmod{50}
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(you will receive little or no credit if you merely guess and check to try to find $x$)