1) Which of the following properties apply to the Baker transformation $T$ on the square $[0, 1) \times [0, 1)$.

   a) The map is continuous.
   b) There is a conjugation of the map to a subshift $S(Y) \subset \{0, 1\}^N$.
   c) There is a conjugation of the map to the shift $S(Y) \subset \{0, 1\}^N$.
   d) The map is area-preserving.
   e) The map has many periodic points.
   f) The map has no periodic points.
   g) The map is invertible.

2) True or False: If you take a subshift $X$ of finite type, and a cellular automaton $\phi$, then $\phi(X)$ is a subshift of finite type.

3) True or False: If you take a sophic subshift and a cellular automaton $\phi$, then $\phi(X)$ is a sophic subshift.

4) Which of the following inclusions are true? (I had this once wrong on the blackboard and Orr had corrected it):

   a) subshifts $\supset$ subshifts of finite type $\supset$ sophic subshifts.
   b) subshifts $\supset$ sophic subshifts $\supset$ subshifts of finite type.

5) True or False: the language of a subshift of finite type is the set of forbidden words.

6) What can you say about the subshift $X$ of finite type over the alphabet $\{a, b, c\}$ defined by the forbidden words $\{aa, bb, cc, ac, ba, cb\}$?

   a) $X$ does not contain any point.
   b) $X$ contains only finitely many points.
   c) $X$ contains infinitely many points.

7) Which of the following subshifts is the shift over the alphabet $\{a, b\}$ for which all words $bab, baab, baaaab, baaaabaab, baaaabaaab, ...$ etc. are forbidden?

   a) The Fibonacci shift
   b) The even shift
   c) The golden mean shift
   d) The full shift.

8) When doing symbolic dynamics for the Arnold cat map $T(x, y) = (2x + y, x + y) \mod 1$, one uses a subshift of finite type over an alphabet with a minimal amount of letters. This alphabet has

   a) 2 elements.
   b) 3 elements.
   c) 5 elements.
   d) 6 elements.

9) Two random variables $Y$ and $Z$ taking finitely many values are called uncorrelated if

   a) $P[Y = a, Z = b] = P[Y = a]P[Z = b]$ for all possible numbers $a, b$.

10) Assume, a sequence of independent identically distributed random variables $Y_1, Y_2, Y_3, ...$ describes drawing a card from an infinite deck containing 52 types of cards. It is assumed that each card appears with the same probability $1/52$ and that a card can appear multiple times. How do you model these random variables?

   a) $Y_k(y) = y$, where $y \in \{1, ..., 52\}$. 
   b) $Y_k(y) = k$, where $y \in \{1, ..., 52\}$.
   c) $Y_k(y) = y$, where $y \in \{1, ..., 52\}$. 
