Question 1. [35 points] The “Invitation” of the Preface of the Hemaspaandra-Ogihara textbook makes the surprising claim that every “student of computer science already possess the ability required to understand, enjoy, and employ complexity theory.” It makes this claim because the book’s view is that at the heart of complexity theory is: __________________________ (fill this in, either in the version of secret 1 of the invitation or in the version of secret 2).

Question 2. [30 points] Give the definition of HP from the slides.

Question 3. [35 points] Prove that if $A$ is a coRE set and $B$ is a coRE set and $A \cap B = \emptyset$, then there exists a recursive set $C$ such that $A \subseteq C \subseteq B$. (Hint: think of last class and the proof that sets that are RE and coRE are recursive, but now with a bit of a twist!) (It is fine if your answer continues on the back of this page.)