Let us take it that all the sets these problems are speaking of must be over the alphabet \{0,1\}, i.e., for this quiz, assume the class RE itself is defined just regarding sets over that alphabet.

**Question 1. [50 points]**

Prove or disprove: RE is closed under symmetric difference (i.e., if A and B are RE, then \((A - B) \cup (B - A)\) is RE).

**Question 2. [50 points]**

Prove or disprove: RE is closed under union (i.e., if A and B are RE, then \(A \cup B\) is RE).
Question 3. [4 points] Answer just true or false (do not give a proof): RE is closed under concatenation (i.e., if A and B are RE, then \( \{ xy \mid x \in A \land y \in B \} \) is RE).

Your answer:

Question 4. [1 point] Answer just true or false (do not give a proof): RE is closed under Kleene closure (i.e., if A is RE, then \( A^* \) is RE).

Your answer: