

CS-172
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Quiz 3

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1. (20 points) Recall that any language, L , falls into one of four categories:
- (a) L is recursive
 - (b) L is r.e. but not recursive
 - (c) \overline{L} is r.e. but not recursive
 - (d) Neither L nor \overline{L} are r.e.

Note that proofs for categories 2,3 or 4 will typically have two parts — one concerning L and the other \overline{L} .
Classify the following language and give a proof.

$$L = \{\langle M \rangle : L(M) = \{\epsilon\}\}$$

(Do not confuse $\{\epsilon\}$ with \emptyset .)

2. (10 points) Show the following language is recursive:

$$L = \{\langle M \rangle : M \text{ eventually writes a symbol other than blank when started on blank tape.}\}$$