METU **Department of Computer Engineering** **Fall 2020**

CENG 223—Discrete Computational Structures

MIDTERM Dec 4, 2020
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Q-3){*24 points*} Construct a natural deduction style proof for the following sequent:

$$\forall x(\neg P(x) \rightarrow Q(x) \wedge R(x)), \exists y(\neg R(y) \vee \neg Q(y)) \vdash \exists z P(z)$$

In your proof,

- every line should be numbered,
- every step should be justified completely (with previous line numbers and the rule being applied, as applicable),
- boxes to delineate scoping should be drawn, and
- only the introduction and elimination rules and reflexivity are allowed (i.e. do not use any derived rules).