

Start Time:

Your name:

Stop Time:

Integrity signature:

Time limit 15 minutes, not counting download and upload. Please add explanation if over 17 minutes.

For these two questions, answer by specifying the universe of the structure as a set and the interpretation of each non-logical symbol as a set of tuples. Use correct notation for the interpretations, e.g., $E^{\mathfrak{A}}$ and $f^{\mathfrak{B}}$. (It is **not** required, but you may wish to draw pictures of the structures if you are taking the quiz by hand.)

1. Let E be a binary predicate symbol.

Give a structure \mathfrak{A} such that $\mathfrak{A} \models \forall x \forall y (E(x, y) \leftrightarrow \neg E(y, x))$.

2. Let f be a unary function symbol.

Give a structure \mathfrak{B} such that $\mathfrak{B} \models \forall x (x \neq f(x) \wedge x \neq f(f(x)))$.