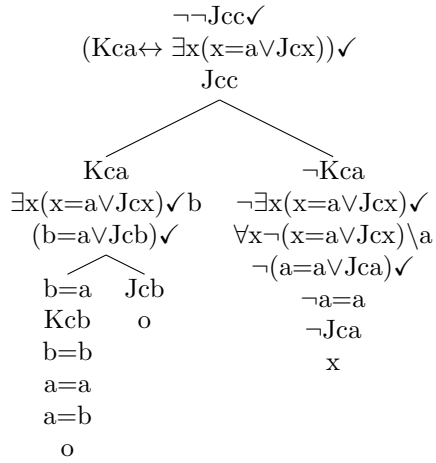
Problem Set 10: GPLI Trees (Answers)

1. Use a tree to test whether the following propositions are jointly satisfiable. If they are, then read a model off the tree.

   (a) ¬¬Jcc, (Kca↔ ∃x(x=a∨Jcx))

   (b) Answer:



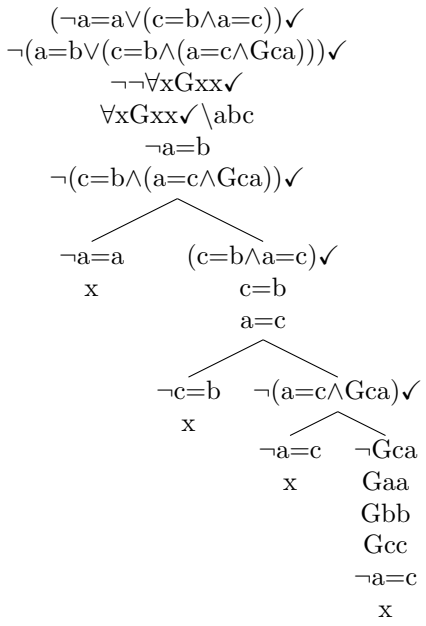
Domain: [2,3]
Referents: [(a,2),(b,2)]
Extensions: [(I,[])(J,[(3,3)])(K,[(3,2)])]

Domain: [1,2,3]
Referents: [(a,1),(b,2)]
Extensions: [(J,[(3,3)(3,2)])(K,[(3,1)])]

2. Use a tree to test whether the following argument is valid. If it is not, then read a countermodel off the tree.

   (a) (¬a=a∨(c=b∧a=c)), ¬(a=b∨(c=b∧(a=c∧Gca))) ∴ ¬∀xGxx

   (b) Answer:


(¬a=a∨(c=b∧a=c))✓
¬(a=b∨(c=b∧(a=c∧Gca)))✓
¬¬∀xGxx✓
∀xGxx✓\abc
¬a=b
¬(c=b∧(a=c∧Gca))✓
¬a=a
x
(c=b∧a=c)✓
c=b
a=c
¬c=b
x
¬(a=c∧Gca)✓
¬a=c
x
¬Gca
Gaa
Gbb
Gcc
¬a=c
x