

Problem 10.5

Assume we have a language consisting of the object constant 0 and unary function constants f and g .

Prove the goal from the given premises.

Proof Editor		
1.	$p(0)$	Premise
2.	$\text{AX}:(p(X) \Rightarrow p(f(X)))$	Premise
3.	$\text{AX}:(p(f(X)) \Rightarrow p(g(X)))$	Premise
4.	$p(X) \Rightarrow p(f(X))$	Universal Elimination: 2
5.	$p(f(X)) \Rightarrow p(g(X))$	Universal Elimination: 3
6.	<div>$p(X)$</div>	Assumption
7.	<div>$p(f(X))$</div>	Implication Elimination: 4, 6
8.	<div>$p(g(X))$</div>	Implication Elimination: 5, 7
9.	$p(X) \Rightarrow p(g(X))$	Implication Introduction: 8
10.	$\text{AX}:(p(X) \Rightarrow p(g(X)))$	Universal Introduction: 9
11.	$\text{AX}:p(X)$	Induction: 1, 2, 10
Goal	$\text{AX}:p(X)$	Complete Submit
<div><div>Assumption</div><div>Negation Introduction</div><div>Implication Introduction</div><div>Universal Introduction</div><div>Reiteration</div><div>Negation Elimination</div><div>Implication Elimination</div><div>Universal Elimination</div></div>		

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