

Chapter 6: Hints and Selected Solutions

Section 6.2 (page 154)

6.2	1.	$P \vee (Q \wedge R)$	
	2.	∇P	
	3.	$P \vee Q$	✓ $\nabla \vee$ Intro: 2
	4.	$P \vee R$	✓ $\nabla \vee$ Intro: 2
	5.	$(P \vee Q) \wedge (P \vee R)$	✓ $\nabla \wedge$ Intro: 3,4
	6.	$\nabla Q \wedge R$	
	7.	Q	✓ $\nabla \wedge$ Elim: 6
	8.	$P \vee Q$	✓ $\nabla \vee$ Intro: 7
	9.	R	✓ $\nabla \wedge$ Elim: 6
	10.	$P \vee R$	✓ $\nabla \vee$ Intro: 9
	11.	$(P \vee Q) \wedge (P \vee R)$	✓ $\nabla \wedge$ Intro: 10,8
	12.	$(P \vee Q) \wedge (P \vee R)$	✓ $\nabla \vee$ Elim: 6-11,2-5,1
6.4	1.	$(A \wedge B) \vee C$	
	2.	$\nabla A \wedge B$	
	3.	B	✓ $\nabla \wedge$ Elim: 2
	4.	$C \vee B$	✓ $\nabla \vee$ Intro: 3
	5.	∇C	
	6.	$C \vee B$	✓ $\nabla \vee$ Intro: 5
	7.	$C \vee B$	✓ $\nabla \vee$ Elim: 5-6,2-4,1

6.9

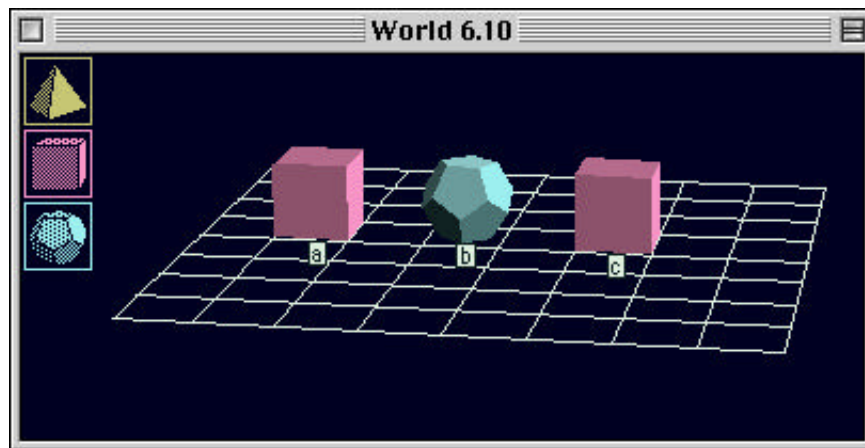
1. Cube(b)	
2. $\neg(\text{Cube}(c) \wedge \text{Cube}(b))$	
3. ∇ Cube(c)	
4. Cube(c) \wedge Cube(b)	✓ ∇ \wedge Intro: 3,1
5. \perp	✓ ∇ \perp Intro: 4,2
6. $\neg\text{Cube}(c)$	✓ ∇ \neg Intro: 3-5

Section 6.3 (page 161)

6.10 One of many possible counterexamples to the following argument is shown below.

Cube(a) \vee Cube(b)
$\neg(\text{Cube}(c) \wedge \text{Cube}(b))$
—
$\neg\text{Cube}(c)$

You should turn in a different counterexample, using this one as a hint.



Section 6.4 (page 166)

6.19	$A \vee B$ $\neg B \vee C$ ▾ A ▾ $\neg B$ $A \vee C$ ▾ Rule? ▾ C $A \vee C$ ▾ Rule? $A \vee C$ ▾ \vee Elim ▾ B ▾ $\neg B$? ▾ Rule? $A \vee C$ ▾ Rule? ▾ C $A \vee C$ ▾ Rule? $A \vee C$ ▾ \vee Elim $A \vee C$ ▾ \vee Elim
------	---

Section 6.5 (page 172)

6.28	1. $\text{Cube}(c) \vee \text{Small}(c)$ 2. $\text{Dodec}(c)$ 3. ▾ $\text{Cube}(c)$ 4. \perp ✓ ▾ Ana Con: 2,3 5. $\text{Small}(c)$ ✓ ▾ \perp Elim: 4 6. ▾ $\text{Small}(c)$ 7. $\text{Small}(c)$ ✓ ▾ \vee Elim: 6-6,3-5,1
------	---

Section 6.6 (page 174)

6.34	1.	
	2.	$\nabla a = b \wedge \text{Dodec}(a) \wedge \neg \text{Dodec}(b)$
	3.	$a = b$ ✓ $\nabla \wedge \text{Elim: } 2$
	4.	$\text{Dodec}(a)$ ✓ $\nabla \wedge \text{Elim: } 2$
	5.	$\text{Dodec}(b)$ ✓ $\nabla = \text{Elim: } 4,3$
	6.	$\neg \text{Dodec}(b)$ ✓ $\nabla \wedge \text{Elim: } 2$
	7.	\perp ✓ $\nabla \perp \text{Intro: } 6,5$
	8.	$\neg(a = b \wedge \text{Dodec}(a) \wedge \neg \text{Dodec}(b))$ ✓ $\nabla \neg \text{Intro: } 2-7$