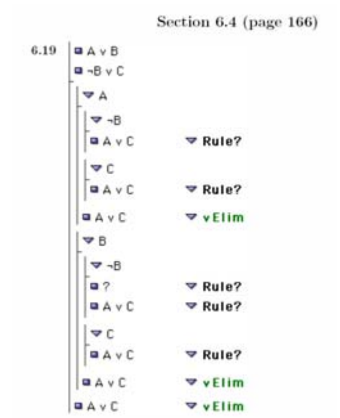
Proof of Resolution Principle
(Proof 6.19)

A ∨ B	
¬ B ∨ C	
A	
A ∨ C	∨ Intro
B	
¬ B	
⊥	⊥ Intro
A ∨ C	⊥ Elim
C	
A ∨ C	∨ Intro
A ∨ C	∨ Elim
A ∨ C	∨ Elim



Two Ways To Use Contradictions

Proof by Contradiction (¬Intro)

¬P
.
.
.
⊥
P

P
.
.
.
⊥
¬ P

Negation Elimination (¬Elim)

.
.
.
⊥
Q (for any Q)

This is usually, as shown, in a subproof, and we choose Q to be the conclusion of the subproof.

6.9

Cube(b)
¬(Cube(c) ∧ Cube(b))

¬Cube(c)

6.9

Cube(b)	
¬(Cube(c) ∧ Cube(b))	
Cube(c)	
⊥	
¬Cube(c)	¬ Intro

6.9

Cube(b)	
¬(Cube(c) ∧ Cube(b))	
Cube(c)	
Cube(c) ∧ Cube(b)	∧ Intro
⊥	⊥ Intro
¬Cube(c)	¬ Intro

Negation 2 in Fitch

Negation 4

¬(¬Dodec(b) ∨ ¬Dodec(c))

Dodec(b) ∧ Dodec(c)

6.28

Cube(c) ∨ Small(c)
Dodec(c)

Small(c)

6.34

¬ (a = b ∧ Dodec(a) ∧ ¬Dodec(b))

6.34

a = b ∧ Dodec(a) ∧ ¬Dodec(b)

⊥
¬ (a = b ∧ Dodec(a) ∧ ¬Dodec(b)) ¬ Intro

6.34

a = b ∧ Dodec(a) ∧ ¬Dodec(b)
a = b ∧ Elim
Dodec(a) ∧ Elim
¬Dodec(b) ∧ Elim

⊥
¬ (a = b ∧ Dodec(a) ∧ ¬Dodec(b)) ¬ Intro

6.34

a = b ∧ Dodec(a) ∧ ¬Dodec(b)	
a = b	∧ Elim
Dodec(a)	∧ Elim
¬Dodec(b)	∧ Elim
Dodec(b)	= Elim
⊥	⊥ Intro
¬ (a = b ∧ Dodec(a) ∧ ¬Dodec(b))	¬ Intro

6.29

Larger(a, b) v Larger(a, c)
Smaller(b, a) v ¬Larger(a, c)
Larger(a, b)

Rapid-fire Examples

1) Given: (A v B) ∧ (A v C)
Prove: A

2) Given: (A v B) ∧ (A ∧ C)
Prove: A

3) Given: (A ∧ B) v (A ∧ C)
Prove: A ∧ (B ∨ C)

4) Given: A v B
C v D
¬C ∧ ¬B
Prove: A ∧ D

5) Given: (A ∧ B) ∧ C
¬A
Prove: C