# Introduction to Logic

## Problem 3.6 - Fitch System

Given $(\neg p \vee \neg q)$, use the Fitch System to prove $\neg(p \wedge q)$.

Start from the given premises. Apply rules of inference by checking the lines you wish to use as premises and click the button for the desired rule of inference. Reiteration allows you to repeat an earlier item. To delete one or more lines from a proof, check the desired lines and click Delete. Whenever entering expressions, use Ascii characters only. (Use ~ for ¬; use & for ∧; use | for ∨; use => for ⇒; and use <=> for ⇔.)

### Proof Editor

| | | |
|---|---|---|
| 1. | ~p \| ~q | Premise |
| 2. | p & q | Assumption |
| 3. | p | And Elimination: 2 |
| 4. | q | And Elimination: 2 |
| 5. | ~p | Assumption |
| 6. | p & q | Assumption |
| 7. | ~p | Reiteration: 5 |
| 8. | p & q => ~p | Implication Introduction: 7 |
| 9. | p & q | Assumption |
| 10. | p | Reiteration: 3 |
| 11. | p & q => p | Implication Introduction: 10 |
| 12. | ~(p & q) | Negation Introduction: 11, 8 |
| 13. | ~p => ~(p & q) | Implication Introduction: 12 |
| 14. | ~q | Assumption |
| 15. | p & q | Assumption |
| 16. | ~q | Reiteration: 14 |
| 17. | p & q => ~q | Implication Introduction: 16 |
| 18. | p & q | Assumption |
| 19. | q | Reiteration: 4 |

| | | |
|---|---|---|
| 20. | p & q => q | Implication Introduction: 19 |
| 21. | ~(p & q) | Negation Introduction: 20, 17 |
| 22. | ~q => ~(p & q) | Implication Introduction: 21 |
| 23. | ~(p & q) | Or Elimination: 1, 13, 22 |
| 24. | p & q => ~(p & q) | Implication Introduction: 23 |
| 25. | p & q | Assumption |
| 26. | p & q => p & q | Implication Introduction: 25 |
| 27. | ~(p & q) | Negation Introduction: 26, 24 |
| Goal | ~(p & q) | Complete |

Premise | Negation Introduction | Implication Introduction
Assumption | Negation Elimination | Implication Elimination
Reiteration | And Introduction | Biconditional Introductio
Delete | And Elimination | Biconditional Elimination
Or Introduction
Or Elimination

Reset | Show XML