Fitch

logica.stanford.edu/php/fitch.php

Prove p & q from the premise ~(~p | ~q)

Goal: p & q

Intuition: Since the goal is of the general form **Φ & Ψ**, perhaps **AND Introduction** is a good way to go. Start by proving p and q separately from the premise.

High-level Approach:
1. Prove p
2. Prove q
3. Use **AND Introduction** on p and q

Proving ~(~p | ~q) [Steps 2 - 9]
- Assume ~p
- Prove ~~p using **Negation Introduction** and subsequently use **Negation Elimination** to prove p.

Similar steps to prove ~(~p | ~q) => q [Steps 10 - 17]

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