

### 3.41.1. Proof Problems

Construct a **proof** for each of the following sentences.

1.  $\sim(P \wedge \sim P)$

2.  $(P \vee \sim P)$

3.  $(\sim Q \vee (\sim P \vee Q))$

4.  $(P \vee (\sim P \vee Q))$

5.  $((P \vee \sim(P \wedge P))$

6.  $((P \vee Q) \vee \sim(P \wedge Q))$

7.  $((P \vee Q) \vee (\sim P \wedge \sim Q))$

8.  $((((P \vee Q) \wedge (\sim P \vee Q)) \vee \sim Q)$

9.  $((((P \wedge Q) \vee (\sim P \wedge Q)) \vee \sim Q)$