1. Study Sections 3.4, 3.5.

2. Prove (3.30) Identity of $\vee$.
    See the hint in Exercise 3.17.

3. Prove (3.31) Distributivity of $\vee$ over $\vee$.
    See the hint in Exercise 3.18.

4. Prove (3.32).

5. Prove (3.36) Symmetry of $\wedge$.
    See the hint in Exercise 3.22.

6. Prove (3.38) Idempotency of $\wedge$.
    See the hint in Exercise 3.23.

7. Prove (3.47a) De Morgan.
    The trick is to use (3.32) twice. You can do the proof in four steps starting with the LHS. Here are the hints for the first three steps.

    $\langle$Golden Rule$\rangle$
    $\langle$(3.9) with the $\neg$ applied to just the first $p\rangle$
    $\langle$(3.32) with $p, q := q, p\rangle$

8. Prove (3.47b) De Morgan.
    Start with $\neg(p \vee q)$ and pull two rabbits out of a hat by using (3.12) double negation on the p and on the q. Then use (3.47a) De Morgan.