1. $(\text{Cube}(a) \wedge \text{Small}(a)) \vee \text{Small}(b)$

    2. ▼ $\text{Cube}(a) \wedge \text{Small}(a)$

    3. $\text{Small}(a)$ ✔ $\wedge$ **Elim** 2

    4. $\text{Small}(a) \vee \text{Small}(b)$ ✔ $\vee$ **Intro** 3

    5. ▼ $\text{Small}(b)$

    6. $\text{Small}(a) \vee \text{Small}(b)$ ✔ $\vee$ **Intro** 5

7. $\text{Small}(a) \vee \text{Small}(b)$ ✔ $\vee$ **Elim** 1,2-4,5-6

1. $(P \lor Q \lor R) \rightarrow S$

2. $\blacktriangledown$ Q

3. $P \lor Q \lor R$ ✔ ∨ Intro   2

4. S ✔ → Elim   3,1

5. $Q \rightarrow S$ ✔ → Intro   2-4

1. $\neg Q \rightarrow \neg P$

2. ▼ P

3. ▼ $\neg Q$

4. $\neg P$ ✔ → **Elim** 3,1

5. $\bot$ ✔ $\bot$ **Intro** 4,2

6. $\neg\neg Q$ ✔ ¬ **Intro** 3-5

7. Q   ✔ ¬ **Elim** 6

8. $P \rightarrow Q$ ✔ → **Intro** 2-7

1. ¬(A ∧ B)
2. B ∨ C
3. C → D

   4. ▼ A

      5. ▼ B
      6. A ∧ B   ✔ ∧ Intro 4,5
      7. ⊥   ✔ ⊥ Intro 1,6

   8. ¬B   ✔ ¬ Intro 5-7

      9. ▼ B
      10. ⊥   ✔ ⊥ Intro 8,9
      11. C   ✔ ⊥ Elim 10

      12. ▼ C
      13. C   ✔ Reit 12

   14. C   ✔ ∨ Elim 2,9-11,12-13
   15. D   ✔ → Elim 3,14

16. A → D   ✔ → Intro 4-15