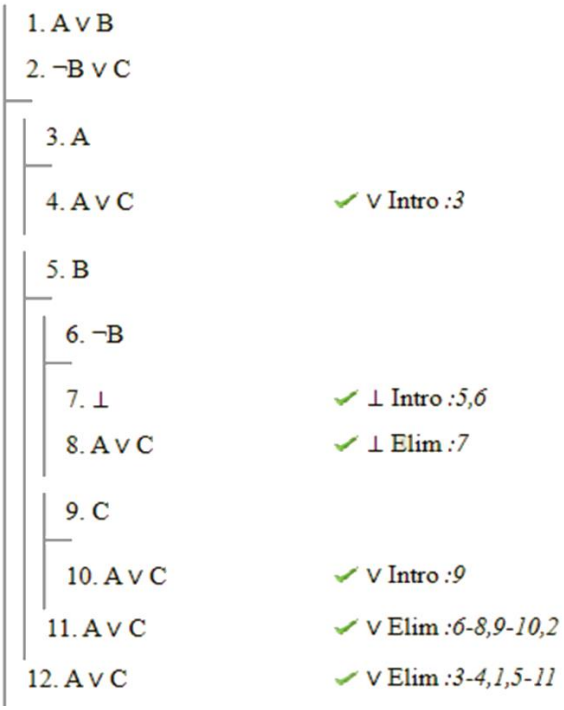
Philosophy 1102

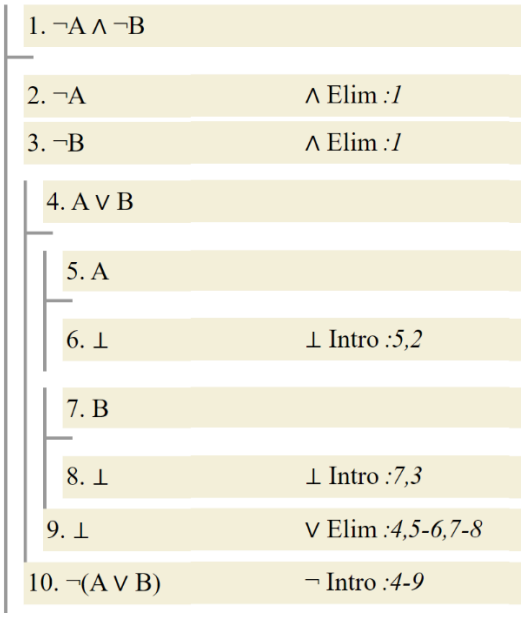
# Answers to Problem Set 5

Total: 50 marks

**1.** [7 marks]




**2.** [7 marks]

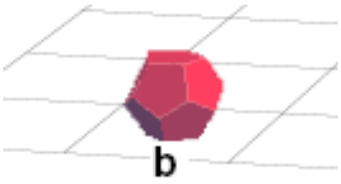


**3.** [7 marks]

| | | |
|---|---|---|
| 1. A ∨ B | | |
| 2. A ∨ C | | |
| 3. A | | |
| 4. A ∨ (B ∧ C) | ✓ | ∨ Intro: 3 |
| 5. B | | |
| 6. A | | |
| 7. A ∨ (B ∧ C) | ✓ | ∨ Intro: 6 |
| 8. C | | |
| 9. B ∧ C | ✓ | ∧ Intro: 8,5 |
| 10. A ∨ (B ∧ C) | ✓ | ∨ Intro: 9 |
| 11. A ∨ (B ∧ C) | ✓ | ∨ Elim: 6-7,8-10,2 |
| 12. A ∨ (B ∧ C) | ✓ | ∨ Elim: 3-4,5-11,1 |

**4.** [4 marks]

The argument is not a logical consequence, as the following world shows. (In this world b is a small dodec, but it could instead be a *medium cube*.)



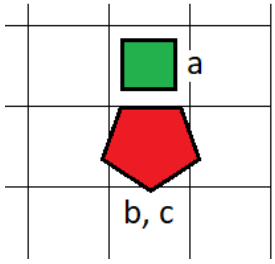

| | |
|---|---|
| T | 1. Dodec(b) ∨ Cube(b) |
| T | 2. Small(b) ∨ Medium(b) |
| T | 3. ¬(Small(b) ∧ Cube(b)) |
| F | 4. Medium(b) ∧ Dodec(b) |

**5.** [7 marks]

1. ¬Small(c) ∨ ¬Small(a)
2. Small(a)
   3. a = c
      4. ¬Small(c)
         5. Small(c) ✓ = Elim *:3,2*
         6. ⊥ ✓ ⊥ Intro *:4,5*
      7. ¬Small(a)
         8. ⊥ ✓ ⊥ Intro *:2,7*
      9. ⊥ ✓ ∨ Elim *:1,4-6,7-8*
   10. a ≠ c ✓ ¬ Intro *:3-9*

**6**. Not a logical consequence. [4 marks]

T | ¬Tet(c) ∨ LeftOf(a, b)
T | Cube(a) ∧ b = c
T | ¬Dodec(b) ∨ (Adjoins(a, b) ∧ BackOf(a, b))
F | ¬SameCol(a, b) ∨ SameShape(a, b)



**7.** [7 marks]

| | |
|---|---|
| 1. | |
| 2. ¬(P ∨ ¬P) | |
| 3. P | |
| 4. P ∨ ¬P | ∨ Intro *3* |
| 5. ⊥ | ⊥ Intro *4,2* |
| 6. ¬P | ¬ Intro :*3-5* |
| 7. P ∨ ¬P | ∨ Intro :*6* |
| 8. ⊥ | ⊥ Intro :*7,2* |
| 9. ¬¬(P ∨ ¬P) | ¬ Intro :*2-8* |
| 10. P ∨ ¬P | ¬ Elim :*9* |

**8.** [7 marks]

| | |
|---|---|
| 1. A ∨ B | |
| 2. ¬B | |
| 3. C | |
| 4. ¬(C ∧ A) | |
| 5. A | |
| 6. C ∧ A | ✔ ∧ Intro :*3,5* |
| 7. ⊥ | ✔ ⊥ Intro :*4,6* |
| 8. B | |
| 9. ⊥ | ✔ ⊥ Intro :*2,8* |
| 10. ⊥ | ✔ ∨ Elim :*1,5-7,8-9* |
| 11. D | ✔ ⊥ Elim :*10* |