

Chapter 6 – Rules of deductive inference

Getting familiar with . . . more rules of inference

A. For 1–10, use disjunctive syllogism, addition, hypothetical syllogism, and/or constructive dilemma to derive the indicated conclusion.

1.

1. $((A \vee B) \supset C)$
2. $(F \& D)$
3. $(C \supset (E \vee H)) \quad \therefore ((A \vee B) \supset (E \vee H))$

2.

1. $(H \vee P)$
2. $((H \vee A) \supset C)$
3. $\sim P \quad \therefore (H \vee A)$

3.

1. $(\sim P \vee (D \vee Z))$
2. $(\sim(D \vee Z) \vee B)$
3. $\sim B \quad \therefore \sim P$

4.

1. $(\sim S \supset R)$
2. $(R \supset B)$
3. $(B \supset \sim Q) \quad \therefore (\sim S \supset \sim Q)$

5.

1. $((P \vee Q) \vee (\sim R \vee \sim S))$
2. $\sim(P \vee Q)$
3. $\sim\sim S \quad \therefore \sim R$

6.

1. $(M \vee N)$
2. $(A \& R)$
3. $(B \vee S) \quad \therefore (((M \vee N) \vee (O \& P)) \vee (Q \vee R))$

7.

1. $((((P \vee Q) \& (R \& S)) \& (T \vee U))$
2. $(A \& B) \quad \therefore (B \vee P)$

8.

1. $(R \supset Q)$
2. $(Q \supset (W \vee X)) \quad \therefore ((R \supset (W \vee X)) \vee P)$

9.

1. A
2. $((A \vee B) \supset \sim C)$
3. $(\sim C \supset F) \quad \therefore ((A \vee B) \supset F)$

10.

1. $((X \vee Y) \vee \sim Z)$
2. $(W \vee \sim \sim Z)$
3. $\sim Y$
4. $\sim W \quad \therefore X$

11.

1. $(\sim S \supset Q)$
2. $(R \supset \sim T)$
3. $(\sim S \vee R) \quad \therefore (Q \vee \sim T)$

12.

1. $((F \vee E) \supset (G \& H))$
2. $(G \vee \sim F)$
3. $(\sim R \& \sim J) \quad \therefore (U \& \sim T)$

13.

1. $((H \supset B) \& (O \supset C))$
2. $(Q \supset (H \vee O))$
3. $Q \quad \therefore (B \vee C)$

14.

1. $(H \supset (D \& W))$
2. $(D \supset K)$
3. $H \quad \therefore (H \& K)$

15.

1. $(B \supset (A \vee C))$
2. $(B \& \sim A) \quad \therefore C$

16.

1. $((A \vee B) \supset C)$
2. $((C \vee D) \supset (G \vee F))$
3. $(A \& \sim G) \quad \therefore F$

17.

1. $((A \& B) \supset \sim C)$
2. $(C \vee \sim D)$
3. $(A \supset B)$
4. $(E \& A) \quad \therefore \sim D$

18.

1. $((\sim A \vee \sim L) \supset \sim G)$
2. $(\sim A \supset (F \supset G))$
3. $(A \supset D)$
4. $\sim D \quad \therefore (\sim F \vee H)$

19.

1. $(F \supset (G \supset \sim H))$
2. $((F \& \sim W) \supset (G \vee T))$
3. $(F \& \sim T)$
4. $(W \supset T) \quad \therefore \sim H$

20.

1. $(P \supset (Q \supset (R \vee S)))$
2. $(P \& Q)$
3. $(S \supset T)$
4. $(\sim T \vee \sim W)$
5. $W \quad \therefore (R \vee W)$