

Chapter 6 – Rules of deductive inference

Getting familiar with . . . proofs

Use the rules from this chapter to derive the indicated conclusion:

1.

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

2.

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

3.

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

4.

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

5.

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

6.

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

7.

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

8.

1. $((R \& S) \supset Q)$
2. $(Q \supset (P \vee R)) \quad \therefore (((R \& S) \supset (P \vee R)) \vee Z)$

9.

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

10.

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

11.

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

12.

1. $(\sim P \ \& \ Q)$
2. $(Q \supset R)$
3. $(P \vee \sim R) \quad \therefore Y$

13.

1. $((M \supset O) \vee S)$
2. $((\sim S \ \& \ N) \ \& \ M)$
3. M
4. $(P \ \& \ \sim O) \quad \therefore (S \vee B)$

14.

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

15.

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

16.

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

17.

1. X
2. $((\sim S \vee Y) \vee Z)$
3. $(\sim Z \ \& \ \sim \sim S) \quad \therefore (W \supset (Y \vee R))$

18.

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

19.

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

20.

1. $((B \ \& \ P) \supset D)$
2. $((P \supset D) \supset H)$
3. $(\sim A \ \& \ B) \quad \therefore (H \ \& \ \sim A)$