Ricardo Barbosa

CST 329

Homework 4 Proofs 2

March 29, 2021

7.1

Check Your Proof:

Proof: Repository - hw7.1

Construct a proof for the argument: $P \rightarrow (R \rightarrow S), \neg S \wedge P \therefore \neg R$

1	$P \rightarrow (R \rightarrow S)$	
2	$\neg S \wedge P$	
3	P	2 Simplification
4	$R \rightarrow S$	1, 3 Modus Ponens
5	$\neg S$	2 Simplification
6	$\neg R$	4, 5 Modus Tollens

new line new subproof

Congratulations! This proof is correct.

check proof start over

Clear & Start a new Proof

7.2

Check Your Proof:

Proof: Repository - hw7.2

Construct a proof for the argument: $P \rightarrow [Q \rightarrow (R \rightarrow S)], Q \wedge R \therefore P \rightarrow S$

1	$P \rightarrow [Q \rightarrow (R \rightarrow S)]$	
2	$Q \wedge R$	
3	$\quad P$	
4	$\quad Q \rightarrow (R \rightarrow S)$	1, 3 Modus Ponens
5	$\quad Q$	2 Simplification
6	$\quad R \rightarrow S$	4, 5 Modus Ponens
7	$\quad R$	2 Simplification
8	$\quad S$	6, 7 Modus Ponens
9	$P \rightarrow S$	3–8 Conditional derivation

new line new subproof

Congratulations! This proof is correct.

check proof start over

Clear & Start a new Proof

7.3

Check Your Proof:

Proof: Repository - hw7.3

Construct a proof for the argument: $P \to Q, P \to R \therefore P \to (Q \wedge R)$

1	$P \to Q$	
2	$P \to R$	
3	$\quad P$	
4	$\quad Q$	1, 3 Modus Ponens
5	$\quad R$	2, 3 Modus Ponens
6	$\quad Q \wedge R$	4, 5 Adjunction
7	$P \to (Q \wedge R)$	3–6 Conditional derivation

new line new subproof

Congratulations! This proof is correct.

check proof start over

Clear & Start a new Proof

7.4

Check Your Proof:

Proof: Repository - hw7.4

Construct a proof for the argument: $P \rightarrow \neg P \therefore \neg P$

1	$P \rightarrow \neg P$	
2	$\neg\neg P$	
3	P	2 Double Negation
4	$\neg P$	1, 3 Modus Ponens
5	$\neg\neg P$	2 Repeat
6	$\neg P$	2–5 Reductio Ad Absurdum

new line new subproof

Congratulations! This proof is correct.

check proof start over

Clear & Start a new Proof

7.5

Check Your Proof:

Proof: Repository - hw7.5

Construct a proof for the argument: $P \rightarrow Q, \neg Q \therefore \neg P$

1	$P \rightarrow Q$	
2	$\neg Q$	
3	$\neg\neg P$	
4	P	3 Double Negation
5	Q	1, 4 Modus Ponens
6	$\neg Q$	2 Repeat
7	$\neg P$	3–6 Reductio Ad Absurdum

new line new subproof

Congratulations! This proof is correct.

check proof start over

Clear & Start a new Proof

7.6

Check Your Proof:

Proof: Repository - hw7.6

Construct a proof for the argument: $\neg(P \rightarrow Q) \therefore \neg Q$

1	$\neg(P \rightarrow Q)$	
2	$\quad\neg\neg Q$	
3	$\quad Q$	2 Double Negation
4	$\quad\quad P$	
5	$\quad\quad Q$	3 Repeat
6	$\quad P \rightarrow Q$	4–5 Conditional derivation
7	$\quad\neg(P \rightarrow Q)$	1 Repeat
8	$\neg Q$	2–7 Reductio Ad Absurdum

new line new subproof

Congratulations! This proof is correct.

check proof start over

Clear & Start a new Proof

7.7

Check Your Proof:

Proof: Repository - hw7.7

Construct a proof for the argument: $(P \wedge Q) \vee (P \wedge R) \therefore P$

1	$(P \wedge Q) \vee (P \wedge R)$	
2	$\neg P$	
3	$\neg(P \wedge Q)$	
4	$P \wedge R$	1, 3 Modus Tollendo Ponens
5	P	4 Simplification
6	$\neg P$	2 Repeat
7	$P \wedge Q$	3–6 Reductio Ad Absurdum
8	P	7 Simplification
9	$\neg P$	2 Repeat
10	P	2–9 Reductio Ad Absurdum

new line new subproof

Congratulations! This proof is correct.

check proof start over

Clear & Start a new Proof

7.8

Check Your Proof:

Proof: Repository - hw7.8

Construct a proof for the argument: $\neg Q \rightarrow P \therefore Q \vee P$

1	$\neg Q \rightarrow P$	
2	$\neg(Q \vee P)$	
3	$\neg\neg Q$	
4	Q	3 Double Negation
5	$Q \vee P$	4 Addition
6	$\neg(Q \vee P)$	2 Repeat
7	$\neg Q$	3–6 Reductio Ad Absurdum
8	P	1, 7 Modus Ponens
9	$Q \vee P$	8 Addition
10	$\neg(Q \vee P)$	2 Repeat
11	$Q \vee P$	2–10 Reductio Ad Absurdum

new line new subproof

Congratulations! This proof is correct.

check proof start over

Clear & Start a new Proof

Check Your Proof:

Proof: Repository - hw7.9

Construct a proof for the argument: $\therefore P \vee \neg P$

1	$\neg(P \vee \neg P)$	
2	$\neg P$	
3	$P \vee \neg P$	2 Addition
4	$\neg(P \vee \neg P)$	1 Repeat
5	P	2–4 Reductio Ad Absurdum
6	$P \vee \neg P$	5 Addition
7	$\neg(P \vee \neg P)$	1 Repeat
8	$P \vee \neg P$	1–7 Reductio Ad Absurdum

new line new subproof

Congratulations! This proof is correct.

check proof start over

Clear & Start a new Proof