

Ricardo Barbosa

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cst 329 Extra Credit

*Please prove ten problems from hw8 and hw9 repository at proof-checker.org. The problems are numbered hw8.1, hw8.2, hw8.8, hw8.9, hw9.1-9.6.*

*A record of your proof will automatically be stored when you get successful proof. You can load those proofs later.*

*Paste the screenshots of your successful proofs in a document with proper labels (e.g., hw9.6 above the screenshot image). Write your name on top of the document. Then create a single pdf of that document and submit it here.*

*Please remember that you are not to work with others in any way on your proofs.*

8.1


### Check Your Proof:

#### Proof: Repository - hw8.1

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

1	$P \rightarrow (Q \wedge R)$	
2	$\neg P \rightarrow R$	
3	$\neg R$	
4	$\neg\neg P$	2, 3 Modus Tollens
5	$P$	4 Double Negation
6	$Q \wedge R$	1, 5 Modus Ponens
7	$R$	6 Simplification
8	$\neg R$	3 Repeat
9	$R$	3-8 Reductio Ad Absurdum

 new line

 new subproof

😊 Congratulations! This proof is correct.

check proof

start over

Clear & Start a new Proof

## 8.2

## Check Your Proof:

## Proof: Repository - hw8.2

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

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



😊 Congratulations! This proof is correct.




## 8.8

## Check Your Proof:

## Proof: Repository - hw8.8

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

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



😊 Congratulations! This proof is correct.

## 8.9

### Check Your Proof:

#### Proof: Repository - hw8.9

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

1	$\neg(P \rightarrow Q)$	
2	$\neg P$	
3	$\neg(P \wedge \neg Q)$	
4	$P$	
5	$\neg Q$	
6	$P \wedge \neg Q$	4, 5 Adjunction
7	$\neg(P \wedge \neg Q)$	3 Repeat
8	$Q$	5-7 Reductio Ad Absurdum
9	$P \rightarrow Q$	4-8 Conditional derivation
10	$\neg(P \rightarrow Q)$	1 Repeat
11	$P \wedge \neg Q$	3-10 Reductio Ad Absurdum
12	$P$	11 Simplification
13	$\neg P$	2 Repeat
14	$P$	2-13 Reductio Ad Absurdum

new line

new subproof

😊 Congratulations! This proof is correct.

[check proof](#)

[start over](#)

## 9.1

### Check Your Proof:

#### Proof: Repository - hw9.1

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

1	$\neg A \rightarrow A$	
2	$\neg A$	
3	$A$	1, 2 Modus Ponens
4	$\neg A$	2 Repeat
5	$A$	2-4 Reductio Ad Absurdum
6	$(\neg A \rightarrow A) \rightarrow A$	1-5 Conditional derivation

new line

new subproof

😊 Congratulations! This proof is correct.

[check proof](#)

[start over](#)

[Clear & Start a new Proof](#)

## 9.2

### Check Your Proof:

#### Proof: Repository - hw9.2

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

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

new line

new subproof

😊 Congratulations! This proof is correct.

check proof

start over

Clear & Start a new Proof

## 9.3

### Check Your Proof:

#### Proof: Repository - hw9.3

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

1	$\neg(P \vee Q)$	
2	$\neg\neg P$	
3	$P$	2 Double Negation
4	$P \vee Q$	3 Addition
5	$\neg(P \vee Q)$	1 Repeat
6	$\neg P$	2-5 Reductio Ad Absurdum
7	$\neg\neg Q$	
8	$Q$	7 Double Negation
9	$P \vee Q$	8 Addition
10	$\neg(P \vee Q)$	1 Repeat
11	$\neg Q$	7-10 Reductio Ad Absurdum
12	$\neg P \wedge \neg Q$	6, 11 Adjunction

new line

new subproof

😊 Congratulations! This proof is correct.

check proof

start over

Clear & Start a new Proof

## 9.4

**Check Your Proof:****Proof: Repository - hw9.4**

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

1	$\neg P \wedge \neg Q$	
2	$\neg\neg(P \vee Q)$	
3	$P \vee Q$	2 Double Negation
4	$\neg P$	1 Simplification
5	$Q$	3, 4 Modus Tollendo Ponens
6	$\neg Q$	1 Simplification
7	$\neg(P \vee Q)$	2-6 Reductio Ad Absurdum



😊 Congratulations! This proof is correct.




## 9.5

**Check Your Proof:****Proof: Repository - hw9.5**

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

1	$P \rightarrow (Q \rightarrow R)$	
2	$P \rightarrow Q$	
3	$P$	
4	$Q$	2, 3 Modus Ponens
5	$Q \rightarrow R$	1, 3 Modus Ponens
6	$R$	4, 5 Modus Ponens
7	$P \rightarrow R$	3-6 Conditional derivation
8	$(P \rightarrow Q) \rightarrow (P \rightarrow R)$	2-7 Conditional derivation
9	$(P \rightarrow (Q \rightarrow R)) \rightarrow ((P \rightarrow Q) \rightarrow (P \rightarrow R))$	1-8 Conditional derivation



😊 Congratulations! This proof is correct.


## Check Your Proof:

### Proof: Repository - hw9.6

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

1			$\neg P \rightarrow \neg Q$		
2				$\neg P \rightarrow Q$	
3					$\neg P$
4					$\neg Q$
5					$Q$
6				$P$	
7			$(\neg P \rightarrow Q) \rightarrow P$		2-6 Conditional derivation
8		$(\neg P \rightarrow \neg Q) \rightarrow ((\neg P \rightarrow Q) \rightarrow P)$			1-7 Conditional derivation
		$P$			3-5 Reductio Ad Absurdum

 new line

 new subproof

😊 Congratulations! This proof is correct.

check proof

start over

Clear & Start a new Proof