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### cst 329 Extra Credit

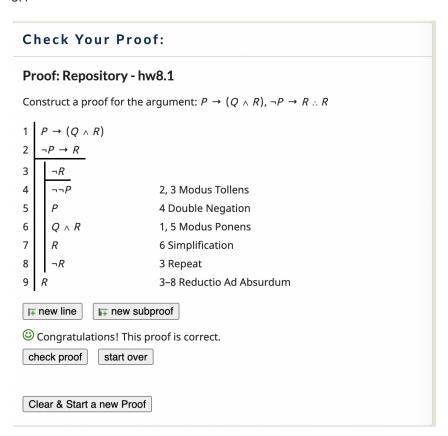
Please prove ten problems from hw8 and hw9 repository at proof-checker.org. The problems are numbered hw8.1, hw8.2, hw8.8, hw8.9, hw9.1-9.6.

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 - hw8.2** Construct a proof for the argument: $P \lor Q \therefore Q \lor P$ 2 $\neg(Q \lor P)$ 3 4 1, 3 Modus Tollendo Ponens 4 Addition 5 6 2 Repeat 7 3-6 Reductio Ad Absurdum 8 7 Addition 9 $\neg(Q \lor P)$ 2 Repeat 10 Q v P 2-9 Reductio Ad Absurdum ∓ new line r new subproof © Congratulations! This proof is correct. check proof start over Clear & Start a new Proof

### 8.8

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#### **Check Your Proof:** Proof: Repository - hw8.9 Construct a proof for the argument: $\neg(P \rightarrow Q) \therefore P$ $1 \mid \neg(P \to Q)$ 2 $\neg P$ 3 4 6 4, 5 Adjunction 3 Repeat 5-7 Reductio Ad 8 Absurdum 9 4-8 Conditional derivation 10 1 Repeat 3-10 Reductio Ad 11 Absurdum 12 11 Simplification 13 $\neg P$ 2 Repeat 2-13 Reductio Ad 14 P Absurdum ☐ new line ☐ new subproof © Congratulations! This proof is correct. check proof start over

## 9.1

**Check Your Proof:** 

check proof

Clear & Start a new Proof

start over

# Proof: Repository - hw9.1 Construct a proof for the argument: $\therefore (\neg A \rightarrow A) \rightarrow A$ 1 1 2 3 4 A 1, 2 Modus Ponens 2 Repeat 5 A 2-4 Reductio Ad Absurdum 6 $(\neg A \rightarrow A) \rightarrow A$ 1-5 Conditional derivation 1-7 New line 1-8 This proof is correct.

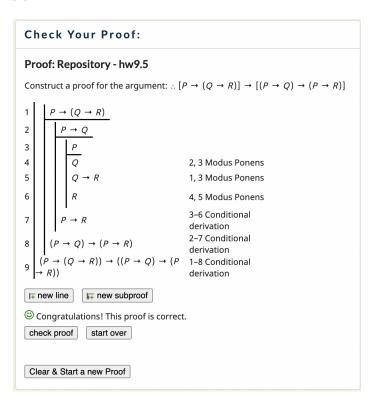
### **Check Your Proof:** Proof: Repository - hw9.2 Construct a proof for the argument: $P \lor Q \therefore Q \lor P$ $\neg(Q \lor P)$ 2 $\neg Q$ 3 1, 3 Modus Tollendo Ponens $Q \vee P$ 4 Addition $\neg(Q \lor P)$ 2 Repeat 7 3-6 Reductio Ad Absurdum $Q \vee P$ 8 7 Addition $\neg(Q \lor P)$ 2 Repeat 10 Q v P 2-9 Reductio Ad Absurdum □ new line □ new subproof $\ensuremath{\mathfrak{G}}$ Congratulations! This proof is correct. check proof start over Clear & Start a new Proof

# 9.3

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Check Your Proof:
Proof: Repository - hw9.3
Construct a proof for the argument: \neg(P \lor Q) : \neg P \land \neg Q
 1 | \neg (P \lor Q)
 2
3
                          2 Double Negation
 4
     P \vee Q
                          3 Addition
 5
    \neg (P \lor Q)
                          1 Repeat
 6
                          2-5 Reductio Ad Absurdum
 7
 8
                          7 Double Negation
9
                          8 Addition
10 \neg (P \lor Q)
                          1 Repeat
11 | ¬Q
                          7-10 Reductio Ad Absurdum
12 \neg P \land \neg Q
                          6, 11 Adjunction
© Congratulations! This proof is correct.
check proof start over
Clear & Start a new Proof
```

# Check Your Proof: Proof: Repository - hw9.4 Construct a proof for the argument: $\neg P \land \neg Q :: \neg (P \lor Q)$ 1 $\neg P \land \neg Q$ $\neg\neg(P\lor Q)$ 2 Double Negation $\neg P$ 1 Simplification 3, 4 Modus Tollendo Ponens $\neg Q$ 1 Simplification 7 $\neg (P \lor Q)$ 2-6 Reductio Ad Absurdum © Congratulations! This proof is correct. check proof start over Clear & Start a new Proof

### 9.5



# **Check Your Proof:**

# **Proof: Repository - hw9.6**

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

2
3
4
$$| \neg P \rightarrow Q |$$
1, 3 Modus Ponens
5
 $| Q |$ 
2, 3 Modus Ponens
6
 $| P |$ 
3–5 Reductio Ad
Absurdum
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

- 1, 3 Modus Ponens
- 2, 3 Modus Ponens
- 3-5 Reductio Ad Absurdum

 new subproof r new line

© Congratulations! This proof is correct.

check proof start over

Clear & Start a new Proof