Seminar 1: Logic

1. Prove

Implication to OR

De Morgan’s

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Implication to OR

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1. Write the negations of each statement, removing the implication.

1. There is an island with two kinds of people, liars, who always tell lies, and knights who always tell the truth. On an excursion you visit this island and encounter two people, person A and person B. A says ”We both are knights”, and person B says “A is a liar”. What conclusion can you draw?

If A is telling the truth, then Both are knights. So B is a knight, B says A is a liar, therefore A is a liar- Contradiction. If A is a liar, then B is telling the truth by its statement, so B is a knight and A is a liar.

1. Prove by contrapositive that the following statement is true.

If is odd, then is even.

Proof by Contrapositive:

If n is odd then is even.

Assume n is odd, n=2k+1 for a k.

Sum of all even terms are even.