

Solutions

Quiz 2: Section 1.2

1. (4 points) Fill in the reasons in the following proof sequence. Make sure you indicate which step(s) each derivation rule refers to.

Statements	Reasons
1. $(p \wedge q) \rightarrow r$	given
2. $\neg(p \wedge q) \vee r$	implication, 1
3. $(\neg p \vee \neg q) \vee r$	De Morgan, 2
4. $\neg p \vee (\neg q \vee r)$	Associativity, 3
5. $p \rightarrow (\neg q \vee r)$	implication, 4

2. (2 points) Is the above proof *reversible*? In other words, can we take $p \rightarrow (\neg q \wedge r)$ as given and show that $(p \vee q) \rightarrow r$ must be true? Explain.

Yes, because we only used inference rules.

3. (4 points) Let x and y be integers. Given the statement
" $x > y$ or x is odd"

what statement follows by the implication rule?

Statement	Reason
$x > y$ or x is odd	given
$\neg(x > y) \rightarrow x$ is odd	implication

If x is not greater than y , then x is odd.