

Examlet 1 Foundations of Advanced Math 2/5/10

1. a) Determine whether the statements $P \Rightarrow Q$ and $\neg P \vee Q$ are equivalent.

b) Determine whether the statements $(P \wedge Q) \Rightarrow R$ and $(P \Rightarrow R) \wedge (Q \Rightarrow R)$ are equivalent.

2. a) If a divides b and b divides c , then a divides c .

b) If $a \equiv_n b$ and $b \equiv_n c$, then $a \equiv_n c$.

3. $\sqrt[3]{2}$ is irrational.

4. Prove that $\forall n \in \mathbb{N}, 2^n > n$.

5. If x is a rational, with $x \neq 0$, and y is irrational, then xy is irrational.

