

Examlet 1 Foundations of Advanced Math 2/3/06

1. a) State the definition of an odd integer.

b) Suppose that n is an integer. Show that if n^2 is even, then n is even.

2. a) Make a truth table for the statement $(P \wedge \neg Q) \Rightarrow R$.

b) The propositional $\neg(P \Leftrightarrow Q)$ is equivalent to $\neg P \Leftrightarrow \neg Q$.

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

4. If c is divisible by b , and b is divisible by a , then c is divisible by a .

5. Show that $(\forall n \in \mathbb{N}) \left(\frac{n^3}{3} + \frac{n^2}{2} + \frac{n}{6} \in \mathbb{Z} \right)$.

Extra Credit [2 points possible]: If a and b are irrational, then a^b is irrational.