

**Examlet 1      Foundations of Advanced Math      2/4/16**

1. Show that the sum of two odd integers is even.

2. Determine whether  $P \vee Q$  is logically equivalent to  $\neg(\neg P \wedge \neg Q)$ .

3. If  $a \equiv_n 1$ , and  $b \equiv_n 1$  then  $a \equiv_n b$ .

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

5. Recall that if  $C$  is a set of real numbers, we say  $b$  is an **upper bound** for  $C$  iff  $\forall x \in C, b \geq x$ . Show that any collection of exactly  $n$  distinct real numbers (where  $n$  is a natural number) has an upper bound.

