

ASSIGNMENT 3, DUE WEDNESDAY 14 FEBRUARY

1. Prove or disprove the following: *For all integers a , b and d , if d divides a and d divides b , then for all integers s and t , d divides $as + bt$.*
2. Prove or disprove the following: *For all integers a , b and c , if a divides bc , then a divides b or a divides c .*
3. Prove that there is no smallest positive real number.
4. Prove that for every real number $\varepsilon > 0$ there exists a natural number N such that whenever n is a natural number and $n > N$, then $1/n < \varepsilon$.
5. Let A and B be sets. Prove that $A = B$ if and only if $\mathcal{P}(A) = \mathcal{P}(B)$.