

Math 560
Fall 2005
Homework 2
Assigned Monday, 29 August, 2005

1. Prove that $\forall p, q \in \mathbb{R}^n, |p - q| \geq |p| - |q|$
2. If $p = (u, v, w)$, show that
 - (a) $|p| \leq |u| + |v| + |w|$
 - (b) $|u| \leq |p|, |v| \leq |p|, |w| \leq |p|$
3. Let l be the line determined by the two points p and q . Let $P = \lambda p + (1 - \lambda)q$. Show that if $\lambda > 1$ then $|P - p| + |p - q| = |P - q|$.
4. Show that the intersection of two convex sets is convex, but that the union of convex sets does not have to be convex.