

PMAT 505    ASSIGNMENT 2    Due October 13, 2010

1. Show that the complete graph  $K_6$  can be embedded in the real projective plane  $\mathbb{R}P^2$ . [10]
2. Show that any well ordered subset  $A$  of the reals  $\mathbb{R}$  is countable. [10]
3. Let  $(X, \leq)$  be a partially ordered set. Define a “topology”  $\mathcal{T}$  on  $X$  just as was done for simply ordered sets, using the base of all open intervals  $\mathcal{B} = \{(a, b) : a, b \in X, a < b\}$ . Show that this does not give a topology, indeed show  $\mathcal{B}$  is not a base. [20]
4. Munkres p.83, 7. [20]
5. Munkres p.91, 1. [20]
6. Munkres p.92, 4. [20]