Homework 2


2. Exercise A1.6. Express the answer for part (c) in terms of the dual norm, which is defined as

$$\|y\|_* = \sup_{\|x\| \leq 1} x^T y.$$ 

In part (e), first show that $C \subseteq (C^o)^o$ for any set $C$. Then show that $(C^o)^o \subseteq C$ if $C$ is closed and convex with $0 \in C$. To prove this you can apply the strict separating hyperplane theorem of page 49 of the textbook: If $C$ is a closed convex set and $x \not\in C$, then there exists a vector $a \neq 0$ and a scalar $b$ such that

$$a^T x > b, \quad a^T z < b$$

for all $z \in C$.

3. Exercise T3.1.

4. Exercise T3.18 (a).

5. Exercise A2.10.