Convex Analysis, Sect. 2.2

Exercise 3

Separating 0 and $\text{conv}\{\, a^1, \ldots, a^m \,\}$.

Exercise 5

(a): for every $x \in C_I$, select its representation in the "basis" a^i with the smallest number of non-zero "coordinates". The vectors a^i in this representation will be linearly independent.

(d): consider a Cauchy sequence in $\text{conv}(S)$, where S is compact in E. Each member of the sequence admits a representation as a convex combination of no more than $n+1$ points in E. Switch to convergent subsequences in this representation.

Exercise 6

Separate c and the cone generated by a^i.