Clustering Algorithms
WS 2015/2016
Handout 4

Exercise 1:
Let $X \subset \mathbb{R}^d$ be a finite point set and let D be the squared Euclidean distance. Show that

$$\mathrm{opt}_1^D(X) = \frac{1}{2 \cdot |X|} \sum_{x,y \in X} D(x,y).$$

Exercise 2:
Let $A \subset \mathbb{R}^d$, $|A| < \infty$, and let d_Φ be a Bregman divergence. Let a be a point that is chosen uniformly at random from A. Show that

$$E[d_\phi(A,a)] = d_\phi(A, c(A)) + d_\phi(c(A), A).$$