

(6) Recall that a nonempty affine subspace  $\mathcal{A}$  of  $\mathbb{R}^n$  is any nonempty subset of  $\mathbb{R}^n$  closed under affine combinations. For any affine map  $f: \mathbb{R}^n \rightarrow \mathbb{R}^m$ , for any affine subspace  $\mathcal{A}$  of  $\mathbb{R}^n$ , and any affine subspace  $\mathcal{B}$  of  $\mathbb{R}^m$ , prove that  $f(\mathcal{A})$  is an affine subspace of  $\mathbb{R}^m$ , and that  $f^{-1}(\mathcal{B})$  is an affine subspace of  $\mathbb{R}^n$ .