ABSTRACT. Many interesting and important problems of best approximation are included in (or can be reduced to) one of the following type: in a Hilbert space X, find the best approximation $P_K(x)$ to any $x \in X$ from the set $K := C \cap A^{-1}(b)$, where C is a closed convex subset of X, A is a bounded linear operator from X into a finite-dimensional Hilbert space Y, and $b \in Y$. The main point of this paper is to show that $P_K(x)$ is *identical* to $P_C(x + A^*y)$—the best approximation to a certain perturbation $x + A^*y$ of x—from the convex set C or from a certain convex extremal subset C_b of C. The latter best approximation is generally much easier to compute than the former. Prior to this, the result had been known only in the case of a convex cone or for *special* data sets associated with a closed convex set. In fact, we give an *intrinsic characterization* of those pairs of sets C and $A^{-1}(b)$ for which this can always be done. Finally, in many cases, the best approximation $P_C(x+A^*y)$ can be obtained numerically from existing algorithms or from modifications to existing algorithms. We give such an algorithm and prove its convergence.