A. FALSE. [A counterexample is $X = \mathbb{B}^2$, $Y = \mathbb{S}^1$, and $r(x, y) = (\cos 2\pi x, \sin 2\pi x)$. If we assumed r to be a retraction, then the statement would be true.]

B. TRUE. [This is the lifting correspondence.]

C. TRUE. [Compactness guarantees that only finitely many charts (the open sets homeomorphic to open subsets of $\mathbb{R}^n$) are needed to cover X. The other two conclusions are in the definition of a manifold.]

D. FALSE. [A counterexample is the open n-ball $B(0, 1) \subseteq \mathbb{R}^n$. Remember: Compactness is not about the existence of a finite open cover. Compactness is about every open cover's having a finite subcover.]

E. TRUE. [This X is homeomorphic to $(0, \infty)$ by the map $p(x, y) = x$, and $(0, \infty)$ is a convex subset of $\mathbb{R}$ and hence simply connected.]