MM 11

For all metric spaces (M, d), $\emptyset$, M and $D_r(x)$ for $x \in M$ and $r > 0$ are always open sets

Properties of Open Sets

(i) If $\{O_\alpha : \alpha \in J\}$ are open in M so is $\bigcup_{\alpha \in J} O_\alpha$

(ii) If $O_1, \ldots, O_n$ are open in M so is $\bigcap_{j=1}^{n} O_j$

(Arbitrary unions of open sets are open. Intersections of finitely many open sets are open.)