Problem 20: Show that if M is a point set and p is a point and every closed interval containing p contains a point of M different from p, then p is a limit point of M.

Proof: Let M be a set and p be a point. Suppose all closed intervals containing p contain a point of M different from p, so $\forall [a, b]$, if $p \in [a, b]$, then $\exists m \in M \cap [a, b]$ such that $m \neq p$.. Let (c, d) be an open interval containing p. Let L be any point between c and p, and let R be any point between p and d. Notice $[L, R] \subset (c, d)$. Since [L, R] is closed and contains p, $\exists m \in M$ such that $m \in [L, R] \cap M \subset M \cap (c, d)$.
Therefore, p is a limit point of M.