It follows from the previous definition that for each $x \in X$, $x \neq x_0$ we have

(1) $$|g(x) - f(x_0)| \geqq \tfrac{1}{3}\delta .$$

Evidently $g \in M(X)$. Further, $|g(x) - f(x)| < \tfrac{2}{3}\delta$ for all $x \in X$, hence

(2) $$\|g - f\| \leqq \tfrac{2}{3}\delta .$$

We shall show that

(a) $K(g, \tfrac{1}{9}\delta) \subset K(f, \delta)$;

(b) $K(g, \tfrac{1}{9}\delta) \cap S(X) = \emptyset$.

It follows from (a), (b) by virtue of the well-known criterion of nowhere density (cf. [2], p. 37) that $S(X)$ is nowhere dense in $M(X)$.

Proof of (a). Let $h \in K(g, \tfrac{1}{9}\delta)$. Then using (2) we have

$$\|h - f\| \leqq \|h - g\| + \|g - f\| < \tfrac{1}{9}\delta + \tfrac{2}{3}\delta < \delta .$$

Proof of (b). Let $h \in K(g, \tfrac{1}{9}\delta)$. Put $V = (h(x_0) - \tfrac{1}{9}\delta,\ h(x_0) + \tfrac{1}{9}\delta)$. Evidently $x_0 \in h^{-1}(V)$. We shall prove that $h^{-1}(V) = \{x_0\}$, hence Int $h^{-1}(V) = \emptyset$, therefore $h \notin S(X)$.

Suppose $x \in X$, $x \neq x_0$, $h(x) \in V$. Then $|g(x) - h(x)| < \tfrac{1}{9}\delta$, $|h(x) - h(x_0)| < \tfrac{1}{9}\delta$, $|h(x_0) - g(x_0)| < \tfrac{1}{9}\delta$, $g(x_0) = f(x_0)$ imply $|g(x) - f(x_0)| < \tfrac{1}{3}\delta$, which contradicts (1). This completes the proof.

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