So with $0 < s < 2$, we have $g \circ h = z$

$\Delta + \Delta = \Delta + \Delta \supset (z + \lambda) - (2z + \lambda) = z$

For some $s < 0$, we have that $f(s) \supset (0, 1)$, so

$\Delta \supset (0, 1)$.

By Lemma 3.4, (p), (q) and Lemma 3.4, (p).

Thus $\Delta \supset (0, 1)$.

Now suppose $z \in (2, 0)$. Then $\Delta \supset (0, 1)$. Notice that $\Delta = (-\lambda, \lambda)$.

Theorem 3.5. Open Mapping Theorem.

**Step 2.** Let $v = T(0; 1/2) = T(0; 1/2)$. Notice that $v = -\lambda$.

Given an injective (onto) $T(0, 1)$, the $X$ and $Y$ are Banach.

Theorem 3.5. Step 2

Therefore $T(\lambda) \supset (0, 1)$.

By Lemma 3.4, (p).

$\lambda \supset (0, 1)$.

Since $\lambda$ is linear.

Therefore.

For some $r < 0$, $0 < s < 2$, and $g \supset (0, 1)$, we have that $g \supset (0, 1)$.

Proof. We follow the steps given in the text.
Theorem 3.5: Open Mapping Theorem

By Step 2, we have shown that $B(r) \subseteq \cup \subseteq \mathbb{R}^n$ and the result now holds.

Theorem 2.3, Open Mapping Theorem

Given a compact (not necessarily convex) $\mathbb{R}^n$ where $X$ and $Y$ are Banach spaces, if $U \subseteq \mathbb{R}^n$ is open then $(U)$ is open.

Theorem 3.5, Open Mapping Theorem

Suppose $\mathbb{R}^n \subseteq B(r)$ such that $z = T(x)$ for any $z \in B(r)$, and $x \in B(2r/3)$. For any nonnegative $k \in \mathbb{N}$, for some $r < 0$ (namely $r = s/2$). From Step 2, we have $B(r) \subseteq \mathbb{R}^n$ and so by Lemma 3.4, $\mathbb{R}^n$ is open.

Theorem 3.5, Open Mapping Theorem

"(*) By the Triangle Inequality, $T \in \mathbb{R}^n$ is bounded and so continuous by Theorem 2.3, Open Mapping Theorem.

Now $\|T \| = \sup_{x \in B(2r/3)} \|T(x)\|$. From above with $k = 1$, choose $x \in B(2r/3)$ such that $\|T(x)\| > \|T\|$. From above with $k = 0$ and $x \in \mathbb{R}^n$, so $\|T\| = \sup_{x \in \mathbb{R}^n} \|T(x)\|$. Then choose $T \in B(2r/3)$.

So for any $x \in \mathbb{R}^n$, either $x \in (T(1) \cup T(2))$ or $x$ is a limit point of $T(1) \cup T(2)$.

Thus $\|T\| = \sup_{x \in \mathbb{R}^n} \|T(x)\|$. From Step 2, we have $B(r) \subseteq \mathbb{R}^n$ and so by Lemma 3.4, $\mathbb{R}^n$ is open.