

This note contains an example of a nowhere continuous weakly Picard operator. Such function contradicts Lemma 1 in [1].

**Definition 1** ([1, Definition 2]). Let  $X$  be a metric space. We say that a mapping  $f: X \rightarrow X$  is a *weakly Picard operator* if for each  $x \in X$  the sequence  $(f^n(x))_{n \in \mathbb{N}}$  is convergent to  $b_x \in X$ , which is a fixed point of  $f$ .

**Lemma 2** ([1, Lemma 1]). *Let  $f: X \rightarrow X$  be a weakly Picard operator and let  $b \in X$  be a fixed point of  $f$ . Then  $f$  is continuous at point  $b$ .*

*Example 3.* For  $q \in \mathbb{Q}$  let  $n_q \in \mathbb{Z}$  and  $d_q \in \mathbb{N}$  be such that  $q = \frac{n_q}{d_q}$  and  $\gcd(n_q, d_q) = 1$ . Consider a function  $f: \mathbb{R} \rightarrow \mathbb{R}$  defined as

$$f(x) = \begin{cases} 0, & x \in \mathbb{R} \setminus \mathbb{Q}, \\ d_x, & x \in \mathbb{Q}. \end{cases}$$

Notice that  $f(\mathbb{R}) = \mathbb{N}_0$  and  $f(\mathbb{N}_0) = \{1\}$ , hence for all  $x \in \mathbb{R}$  we get  $f(f(x)) = 1 = f(1)$ . Furthermore  $f$  is discontinuous at each point of  $\mathbb{R}$ .

## References

- [1] Vasile Berinde. On the solution of steinhaus functional equation using weakly picard operators. *Filomat*, 1, 04 2011.