

1. Let $h(x) = 1 - |(x \bmod 2) - 1|$

Plot $h(x)$. Is it continuous? differentiable?

What is $h(2k)$ for any $k \in \mathbb{Z}$?

2. Let $h_n(x) = \frac{1}{2^n} h(2^n x)$

Plot $h_0(x)$, $h_1(x)$, $h_2(x)$, and $h_5(x)$

Are these functions continuous? differentiable?

3. Let $g_k(x) = h_0(x) + h_1(x) + \cdots + h_k(x)$.

Plot $g_0(x)$, $g_1(x)$, $g_2(x)$, and $g_5(x)$

Are these functions continuous? differentiable?