Section 4

Given \( \lim_{x \to 4} f(x) = 4 \), \( \lim_{x \to 4} g(x) = 0 \), \( \lim_{x \to 4} h(x) = 5 \)

Find the limit, if it exists. If it does not exist, explain why.

1. \( \lim_{x \to 4} (3f(x) + g(x)) = 3 \cdot 4 + 0 = 12 \)
2. \( \lim_{x \to 4} (f(x))^3 = 4^3 = 64 \)
3. \( \lim_{x \to 4} \frac{h(x)}{g(x)} \) limit does not exist because \( \lim_{x \to 4} g(x) = 0 \) so we get division by 0.
4. \( \lim_{x \to 4} \frac{5f(x)g(x)}{h(x)} = \frac{5 \cdot 4 \cdot 0}{5} = 0 \)
5. \( \lim_{x \to 4} \sqrt{f(x)} = \sqrt{4} = 2 \)