

Workshop 2: questions for week 3

1. Prove that $a \in \mathbb{R}$ is a cluster point of $D \subseteq \mathbb{R}$ if, and only if, there exists a sequence (x_n) in $D \setminus \{a\}$ which converges to a .
2. Give a direct ε - δ proof that $\lim_{x \rightarrow -2} \frac{x+2}{x^3+8} = \frac{1}{12}$.
3. Give a direct ε - δ proof that $\lim_{x \rightarrow 0} \frac{1}{x}$ does not exist.
4. Let $f : \mathbb{R} \rightarrow \mathbb{R}$ such that $f(x) = \begin{cases} 7 & x > 50 \\ 26 & x \leq 50 \end{cases}$.
 - (a) Prove that f is discontinuous at 50.
 - (b) Prove that f is continuous at 49.9.