(3) Prove or disprove: If $\{a_n\}_{n=1}^{\infty}$ diverges to $-\infty$ then $\{-a_n\}_{n=1}^{\infty}$ diverges to $+\infty$.

Proof:

Let $\{a_n\}_{n=1}^{\infty}$ diverge to $-\infty$.
To show that $\{-a_n\}_{n=1}^{\infty}$ diverges to $+\infty$,
let $M \in \mathbb{R}$. By def. of "$\{a_n\}_{n=1}^{\infty}$
diverges to $-\infty$" applied with the real
number $-M$, there exists some $N \in \mathbb{R}$
such that for $n > N$ we have $a_n < -M$.
For such an n, we thus have $-a_n > M$.
Thus, for the same N, if $n > N$, then
$-a_n > M$. This shows that $\{-a_n\}_{n=1}^{\infty}$
diverges to $+\infty$.