Katherine Lacy

P D2.1

Part (a)

Proposition: The series $-3, -3, -3, -3...$ converges to $-3$.

Proof. Let $a = -3$ and let $\epsilon > 0$.

Now let $N = 1$. Observe that for all $n > N$, $a_n = -3$ thus $d(a_n, a) = | -3 - a |$. Further $a = -3$ so $d(a_n, a) = | -3 - (-3) | = 0$. Notice that $0 < \epsilon$ because we chose $\epsilon > 0$. So for all $\epsilon > 0$ there exists $N \in \mathbb{N}$, namely $N = 1$, such that for all $n > N$ the $d(a_n, a) < \epsilon$. Thus by definition of convergence, the sequence $-3, -3, -3, ...$ to $-3$. \qed