

$\sum_{n=1}^{\infty} \arctan 4n$ diverges by the Test for Divergence[†] since

$$\lim_{n \rightarrow \infty} a_n = \lim_{n \rightarrow \infty} \arctan 4n = \frac{\pi}{2} \neq 0.$$

†

Test for Divergence If $\lim_{n \rightarrow \infty} a_n$ does not exist or if $\lim_{n \rightarrow \infty} a_n \neq 0$, then the series $\sum_{n=1}^{\infty} a_n$ is divergent.