

7. [14 points] For each of the following sequences

1. Compute $\lim_{n \rightarrow \infty} a_n$.

2. Decide if $\sum_{n=0}^{\infty} a_n$ converges or diverges. Circle your answer.

Support your answer by stating the test(s) or facts you used to prove convergence or divergence, and show complete work and justification.

a. [4 points]

$$a_n = \left(\frac{-1}{\pi} \right)^n \quad \lim_{n \rightarrow \infty} a_n = \text{_____} \quad \sum_{n=0}^{\infty} a_n : \quad \text{Converges} \quad \text{Diverges}$$

b. [4 points]

$$a_n = \frac{n^2 + 2}{1 + 4n^2} \quad \lim_{n \rightarrow \infty} a_n = \text{_____} \quad \sum_{n=0}^{\infty} a_n : \quad \text{Converges} \quad \text{Diverges}$$

c. [6 points]

$$a_n = \frac{n}{\sqrt{n^4 + 5}} \quad \lim_{n \rightarrow \infty} a_n = \text{_____} \quad \sum_{n=0}^{\infty} a_n : \quad \text{Converges} \quad \text{Diverges}$$