1. (4 points) Set up the integral to find the surface area of a unit sphere. Evaluate it.

2. Consider the series

\[ \sum_{n=1}^{\infty} a_n, \]

where \( a_n > 0 \). Let \( P_k \) be the sequence of its partial sums:

\[ P_k = \sum_{n=1}^{k} a_n. \]

It is known that \( P_k < 10 \) for all \( k \).

(a) (3 points) Does the series \( \sum_{n=1}^{\infty} a_n \) necessarily converge? Justify your answer (if yes, show why; if no, provide a counterexample).

(b) (3 points) Does the limit \( \lim_{n \to \infty} a_n \) exist? If so, find it. Justify your answer.