3. [12 points] Consider the following sequences, all defined for \( n = 1, 2, 3, \ldots \)

\[
a_n = \int_0^n 10e^{-t} \, dt
\]

\[
b_n = (-1)^n \frac{100}{n^{0.75}}
\]

These are the same first two sequences from the previous problem.

a. [6 points] Does the series \( \sum_{n=1}^{\infty} a_n \) converge or diverge? Fully justify your answer, including full mechanics of any tests you use. 

\[\text{Circle one: Converges \hspace{1cm} Diverges}\]

b. [6 points] Does the series \( \sum_{n=1}^{\infty} b_n \) converge or diverge? Fully justify your answer, including full mechanics of any tests you use. 

\[\text{Circle one: Converges \hspace{1cm} Diverges}\]