3. [8 points] For $n = 1, 2, 3, \ldots$ consider the sequence a_n given by

$$a_n = \frac{-1}{2^{(n+1)/2}} \text{ if } n \text{ is odd}, \qquad a_n = \frac{1}{3^{n/2}} \text{ if } n \text{ is even}.$$

a. [2 points] Write out the first 5 terms of the sequence a_n.

b. [2 points] The series $\displaystyle\sum_{n=1}^{\infty} a_n$ is alternating. In a sentence or two, explain why the

Alternating Series Test **cannot** be used to determine whether $\displaystyle\sum_{n=1}^{\infty} a_n$ converges or diverges.

c. [4 points] The series $\displaystyle\sum_{n=1}^{\infty} a_n$ converges. Show that it converges, either by using theorems about series, or by computing its exact value.