2. [14 points] Consider the following sequences, all defined for $n = 1, 2, 3, \ldots$

$$a_n = \int_0^n 10e^{-t}\,dt$$
$$b_n = (-1)^n \frac{100}{n^{0.75}}$$
$$c_n = 5(-3)^{n-3}$$

a. [3 points] Which sequences are monotone? No justification is required for this part of the problem. Circle your final answer(s) below.

Circle your answer(s): a_n b_n c_n NONE

b. [3 points] Which sequences are bounded? No justification is required for this part of the problem. Circle your final answer(s) below.

Circle your answer(s): a_n b_n c_n NONE

c. [3 points] Which sequences are convergent? No justification is required for this part of the problem. Circle your final answer(s) below.

Circle your answer(s): a_n b_n c_n NONE

d. [5 points] Write a closed form expression for the series $\sum_{n=2}^{2023} c_n$. Your expression should be able to be evaluated using a simple calculator (i.e. no letters, no ellipses ($\ldots$) and no sigma notation). Do not simplify the numbers in your expression.

Answer: $\sum_{n=2}^{2023} c_n =$ _____