3. [5 points] Throughout this problem, suppose that:

- a_n is a sequence with $a_1 = 60$, and with $a_{n+1} = \frac{1}{3}a_n$ for all $n \geq 1$.
- b_n is a sequence with $b_1 = \frac{1}{2}$, and with $b_{n+1} = 2b_n$ for all $n \geq 1$.
- $S_n = \sum_{j=1}^{n} a_j$.
- $R_n = \sum_{k=1}^{n} S_k$.

For each of the following sequences, determine whether the sequence converges or diverges, and if it converges, determine the value that it converges to. Justification is not required.

a. [1 point] a_n

Circle one: **Diverges** **Converges to** _____

b. [1 point] b_n

Circle one: **Diverges** **Converges to** _____

c. [1 point] $c_n = a_n \cdot b_n$

Circle one: **Diverges** **Converges to** _____

d. [1 point] S_n

Circle one: **Diverges** **Converges to** _____

e. [1 point] R_n

Circle one: **Diverges** **Converges to** _____