8. [9 points] Consider the following 4 sequences.

$$(A)\ \ a_n = (-1)^n, \qquad (B)\ \ b_n = 3 \cdot (0.5)^n,$$

$$(C)\ \ c_n = \sum_{k=1}^{n} \frac{1}{k}, \qquad (D)\ \ d_n = \int_0^n \frac{x}{e^x}\, dx$$

For each of the following, write down the CAPITAL LETTER corresponding to each of the sequences that satisfy the given property. **No justification is required.**

a. [3 points] Which sequence(s) is/are bounded?

Solution: A,B,D

b. [3 points] Which sequence(s) is/are monotone?

Solution: B,C,D

c. [3 points] Which sequence(s) is/are convergent?

Solution: B,D