9. [12 points] For each of the following sequences, defined for integers $n \ge 1$, decide whether the sequence is monotone increasing, monotone decreasing, or not monotone, and whether it is bounded or unbounded. Circle your answers. No justification is required.

(i)
$$a_n = (-1)^n \left(1 + \frac{1}{n}\right)$$

Circle **all** that apply:

Monotone Increasing	Monot	one Decreasing	Not Monotone
Bo	unded	Unbounded	
(ii) $b_n = \frac{1}{1 + \ln(n)}$			
Circle all that apply:			
Monotone Increasing	Monot	one Decreasing	Not Monotone

Bounded

Unbounded

(iii)
$$c_n = \sum_{k=1}^n \frac{(-3)^k}{5^k}$$

Circle all that apply:

Monotone Increasing

Monotone Decreasing

Not Monotone

Bounded

Unbounded

(iv)
$$r_n = \sum_{k=1}^n \left(1 + \frac{1}{k}\right)$$

Circle all that apply:

Monotone Increasing	Monot	one Decreasing	Not Monotone
Bou	nded	Unbounded	

$$(\mathbf{v}) \ s_n = \int_{1/2^n}^1 \frac{1}{\sqrt{x}} \,\mathrm{d}x$$

Circle all that apply:

Monotone Increasing	Monotone Decreasing		Not Monotone
E	Bounded	Unbounded	

(vi)
$$t_n = \sum_{k=2}^{n+1} \frac{1}{k \ln k}$$

Circle all that apply:

Monotone Increasing

Monotone Decreasing

Not Monotone

Bounded

Unbounded