33. Discuss the monotonicity of: $8n + 5$, $\frac{(-1)^n}{5n}$, $n + \frac{(-1)^n}{n}$, $\frac{1}{n^2} + \frac{(-1)^n}{3^n}$.

34. Let $a_1 = 0.1$ and $a_{n+1} = a_n(2 - 3a_n)$ for $n \in \mathbb{N}$. Find $\lim_{n \to \infty} a_n$.

35. Let $a_1 = 2$ and $a_{n+1} = \frac{1}{2}\left(a_n + \frac{3}{a_n}\right)$ for $n \in \mathbb{N}$. Find $\lim_{n \to \infty} a_n$.

36. State and prove the Cauchy condition for a series of the form

$$s_n := \sum_{k=1}^n a_k.$$

37. Prove

$$s_n := \sum_{k=1}^n a_k \quad \text{converges} \quad \implies \quad a_k \to 0.$$

38. Prove

$$a_k \to 0 \quad \text{is decreasing} \quad \implies \quad s_n := \sum_{k=1}^n (-1)^k a_k \quad \text{converges.}$$