

$$1. a_n = \cos(\pi n)$$

$$2. a_n = 3 + \left(-\frac{1}{2}\right)^n$$

$$3. a_n = \frac{e^n + 3^n}{5^n}$$

$$4. a_n = -2^{-n}$$

$$5. \lim_{n \rightarrow \infty} \frac{(-1)^n n^2 + n}{4n^2 + 1}$$

$$6. \lim_{n \rightarrow \infty} \frac{3n^{5/2} + 4}{n\sqrt{2n^3 + 1}}$$

$$7. \lim_{n \rightarrow \infty} \frac{n^3 + 2e^{-n}}{3n^3 + 4e^{-n}}$$