

$$(12) \quad a_n = \frac{2n+1}{(2n)!} \Rightarrow a_{n+1} = \frac{2n+3}{(2n+2)!}$$

$$a_{n+1} - a_n = \frac{2n+3}{(2n+2)!} - \frac{2n+1}{(2n)!}$$

$$= \frac{2n+3 - (2n+1)(2n+2)(2n+1)}{(2n+2)!}$$

$$= \frac{2n+3 - 8n^3 - 16n^2 - 10n - 2}{(2n+2)!}$$

$$= \frac{-8n^3 - 16n^2 - 8n + 1}{(2n+2)!} = \frac{-8n(n^2 + 2n + 1) + 1}{(2n+2)!}$$

$$= \frac{1 - 8n(n+1)^2}{(2n+2)!} < 0 \quad \text{since} \quad 8n(n+1)^2 > 1 \quad \text{for } n \geq 1$$

So the sequence is strictly decreasing.