Classifying Sequences

A sequence is **strictly increasing** if the terms are always increasing, i.e.

$u\_{n+1}>u\_{n}$ for all $n\in N$.

*e.g.* $1, 2, 4, 8, 16, …$

Similarly a sequence is **strictly decreasing** if $u\_{n+1}<u\_{n}$ for
all $n\in N$

A sequence is **periodic** if the terms repeat in a cycle. The **order** $k$ of a sequence is **how often it repeats**, i.e. $u\_{n+k}=u\_{n}$ for all $n$.

*e.g. 2, 3, 0, 2, 3, 0, 2, 3, 0, 2, … is periodic and has order 3.*

Examples

For each sequence:

1. State whether the sequence is increasing, decreasing or periodic.
2. If the sequence is periodic, write down its order.
3. $u\_{n+1}=u\_{n}+3,  u\_{1}=7$
4. $u\_{n+1}=\left(u\_{n}\right)^{2},    u\_{1}=\frac{1}{2}$
5. $u\_{n+1}=\sin(\left(90n°\right))$

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