Number Sequences Glossary

Glossary of terms

Linear sequence This is given by the formula $u_n = an + b,\ (n = 1, 2, 3, ...)$ where a and b are constants. For example, $u_n = 3n + 4$ gives the sequence $7,\ 10,\ 13,\ 16,\ 19,\ ...$

Fibonacci Sequence This is defined by $u_n = u_{n-1} + u_{n-2}\ \ (n = 3, 4, 5, ...)$ with $u_1 = u_2 = 1$. This gives the sequence

$$1,\ 1,\ 2,\ 3,\ 5,\ 8,\ 13,\ ...$$

Iterative formula When the nth term in a sequence is given in a formula in terms of earlier terms, but with sufficient information to generate the complete sequence. For example,

$$u_n = u_{n-1} + 1\ ,\ u_1 = 0 \quad \text{for } n = 2, 3, \ldots$$

$$u_n = u_{n-1} + u_{n-2}\ ,\ u_1 = 1,\ u_2 = 1 \quad \text{for } n = 3, 4, \ldots$$

$$u_n = \frac{u_{n-1}}{2}\ ,\ u_1 = 2 \quad \text{for } n = 2, 3, \ldots$$

Convergence This is where the terms of a sequence are tending towards a finite number.

For example, $1,\ \frac{1}{2},\ \frac{1}{4},\ \frac{1}{8},\ \ldots$ converges to 0

$1,\ 1 - \frac{1}{2},\ 1 - \frac{1}{3},\ 1 - \frac{1}{4},\ \ldots$ converges to 1

Divergence This is where the terms of a sequence are tending towards infinity.

For example, $1,\ 2,\ 4,\ 8,\ 16, ...$

$5,\ 10,\ 15,\ 20,\ 25, ...$