Divergent sequence

If a sequence does not converge, then it is said to *diverge* or to be a *divergent sequence*.

For example, the following sequences all diverge, even though they do not all tend to infinity or minus infinity:

$$1,\ 2,\ 4,\ 8,\ 16,\ 32,\ \ldots$$
$$1,\ 0,\ 1,\ 0,\ 1,\ 0,\ \ldots$$
$$0,\ 1,\ 0,\ 2,\ 0,\ 4,\ 0,\ 8,\ \ldots$$
$$1,\ -2,\ 3,\ -4,\ 5,\ -6,\ \ldots$$