we may suspect that the role of v is only auxiliary. This is in fact the case – the formula holds for any compact complex manifold – but we do not have available here the technique necessary to prove it. Our derivation of the formula thus remains only a suggestion, and not a proof; we will, however, give a geometric proof of the formula for algebraic surfaces in the next chapter.

5. Spectral Sequences and Applications

Spectral Sequences of Filtered and Bigraded Complexes

Spectral sequences are algebraic tools for working with cohomology; basically they form an array of long exact sequences fit into a systematic pattern and are to be applied in a similar fashion. To someone who works with cohomology, they are essential in the same way that the various integration techniques are essential to a student of calculus. We shall use spectral sequences in rather limited circumstances, but it seems worthwhile to give the general definitions.

A complex $(K^*, d) = \{K^0 \xrightarrow{d} K^1 \xrightarrow{d} K^2 \longrightarrow \cdots\}$ is a sequence of Abelian groups with differentials

$$d : K^p \longrightarrow K^{p+1}$$

satisfying $d \cdot d = 0$.