Definition: Semitone Integer Notation

- *Is a notational system so that for any two notes $x_n, y_n \in \mathbb{W}$ (written in Note Integer Notation), we denote the number of semitones between the two notes as an integer.*
  - *So instead of saying, y_n is a perfect 5th above x_n, we would say y_n is seven above x_n, and write $x_n + 7 = y_n$*
- *Since x_n, y_n are written in NIN, we have that for any $\alpha \in \mathbb{Z}$ that the note $x_n + \alpha = (x + \alpha)_n$*
- *In general the interval which must be added to x_n to get to y_n is $y - x$*
  - *From the above it holds:*

$$x_n + (y - x) = (x + y - x)_n = y_n$$

Examples

- *If $x = 5$ and $y = 9$, then the interval which must be added is $9 - 5 = 4$*
- *It's also possible for it to be a negative number, if $x = 11$ and $y = 2$, then you have to add $2 - 11 = -9$ semitones to x_n to get to y_n, this corresponds to moving down 9 semitones*