

Music

Harmonic Sequence

$1x, 2x, 3x, 4x, 5x, \dots$

$x/1, x/2, x/3, x/4, x/5, \dots$

Simple Ratios

2:1, 3:2, 4:3, 5:3, 5:4, 7:4, 6:5, 7:5, 8:5, 9:5, 7:6, 11:6, etc.

Intervals

“octave” 2:1

“fifth” 3:2

“fourth” 4:3

Circle of fifths.

Tempered Tuning

n notes per octave

N note number

x note frequency

x_0 reference frequency, usually 440Hz for A4

$$x = x_0 2^{N/n} \tag{1}$$

$$N = n \log_2(x/x_0) \tag{2}$$

With twelve notes per octave we have: A, A \sharp , B, C, C \sharp , D, D \sharp , E, F, F \sharp , G, G \sharp , (repeat) with the note number of A4 being 0, A \sharp 4 being 1, etc.