Waveform Beating

FILE: Wave.cln

Introduction

When two sound waves of slightly different frequency are added together, they interfere to produce a beating effect. This sheet generates the waveforms and displays the resulting sum of the two waves.

In this sheet we never calculate the points of the graph, instead we calculate the **equations** describing the curves, the XY Scatter graph object converts these equations to the line graphs for us.

Using this Sheet

When you open this sheet, you may find it easier to select 'Scale to Fit' on the Settings-Scale dialogue. This will reduce the sheet down to a workable size.

You can also switch on Automatic Recalculation to force the sheet to be recalculated every time the reference frequency is changed.

Wave A   The graph labeled Wave A displays the waveform whose frequency can be varied. The equation that specifies this graph is simply **sin(x*a)** where **'a'** is the multiplier from the reference frequency. For example sin(x*2) would be a wave with a frequency twice the reference frequency.

Wave B   The graph labeled Wave B is the reference wave. Its equation is simply **sin(x)**

Sum of Waves   Adding these two waves together produces the Sum of Waves Graph. The equation for this graph is **sin(x*a)+sin(x)** .

Frequency Multiplier   This slider is used to enter the factor by which the reference wave's frequency is multiplied. Example: 1.1 is a frequency 10% higher than the reference wave.

You can see from the Sum of Waves graph that adding two waves with similar frequencies cause beats to appear in the resulting sound.