Examples of Consonance

Frequency Ratio 1:1

\[ A_2(t) = A_2 \cdot \sin(\omega_2 t) \text{ vs. } A_1(t) = A_1 \cdot \sin(\omega_1 t) \]
\[ A_2 = A_1 = 1.0, \omega_2/\omega_1 = 1/1 = 1.000000 \]

\[ A_2(t) = A_2 \cdot \cos(\omega_2 t) \text{ vs. } A_1(t) = A_1 \cdot \sin(\omega_1 t) \]
\[ A_2 = A_1 = 1.0, \omega_2/\omega_1 = 1/1 = 1.000000 \]

\[ A(t) = A_1(\omega_1 t) + A_2(\omega_2 t) \text{ vs. } (\omega_1 t) \]
\[ A_2 = A_1 = 1.0, \omega_2/\omega_1 = 1/1 = 1.000000 \]
Frequency Ratio 2:1

\[ A(t) = A_0 \sin(w_2t) \quad \text{vs.} \quad A(t) = A_0 \sin(w_1t) \]
\[ A_0 = 1.0, \quad f_1 = 1/t, \quad f_2 = 2/t, \quad 2.0 \text{ radians} \]

\[ A(t) = A_0 \cos(w_2t) \quad \text{vs.} \quad A(t) = A_0 \sin(w_1t) \]
\[ A_0 = 1.0, \quad f_1 = 1/t, \quad f_2 = 2/t, \quad 2.0 \text{ radians} \]

\[ A(t) = A_0 \sin(w_1t) + A_2 \cos(w_2t) \quad \text{vs.} \quad A_1 \sin(w_1t) \]
\[ A_0 = 1.0, \quad f_1 = 1/t, \quad f_2 = 2/t, \quad 2.0 \text{ radians} \]
Frequency Ratio 3:1

\[ A(t) = A_0 \sin(w_1 t) \text{ vs. } A(t) = A_0 \sin(w_1 t) \]
\[ A_2(t) = A_0 \cos(w_2 t) \text{ vs. } A(t) = A_0 \sin(w_1 t) \]
\[ A_3(t) = A_1 \sin(w_1 t) + A_2 \sin(2w_1 t) \text{ vs. } (w_1 t) \]

\[ A_2(t) = A_1 = \frac{A_0}{2}, \quad A_3(t) = \frac{3A_0}{2} = 3.09006019 \]
Frequency Ratio 4:1

\[ A_2(t) = A_1 \cdot \sin(\omega_2 t) \text{ vs. } A_1(t) = A_1 \cdot \sin(\omega_1 t) \]
\[ A_2(t) = A_1 + 1.0, \omega_2 = \omega_1 + 0.00000001 \]

\[ A_2(t) = A_1 \cdot \cos(\omega_2 t) \text{ vs. } A_1(t) = A_1 \cdot \sin(\omega_1 t) \]
\[ A_2(t) = A_1 + 1.0, \omega_2 = \omega_1 + 0.00000001 \]

\[ A_{tot}(t) = A_1(\omega_1 t) + A_2(\omega_2 t) \text{ vs. } (\omega_1 t) \]
\[ A_{tot}(t) = A_1 + 1.0, \omega_2 = \omega_1 + 0.00000001 \]
Frequency Ratio 5:1

\[ A_{1}(t) = A_{0} \sin(\omega_{1}t) \] vs. \[ A_{2}(t) = A_{10} \sin(\omega_{1}t) \]
\[ A_{20} = A_{10} = 1.0, \, f_{21} = 5 \times 10^{-5} \]

\[ A_{1}(t) = A_{10} \cos(\omega_{1}t) \] vs. \[ A_{2}(t) = A_{10} \sin(\omega_{1}t) \]
\[ A_{20} = A_{10} = 1.0, \, f_{21} = 5 \times 10^{-5} \]

\[ A_{1}(t) = A_{10}(\omega_{1}t) + A_{2}(\omega_{2}t) \] vs. \[ (\omega_{1}t) \]
\[ A_{20} = A_{10} = 1.0, \, f_{21} = 5 \times 10^{-5} \]