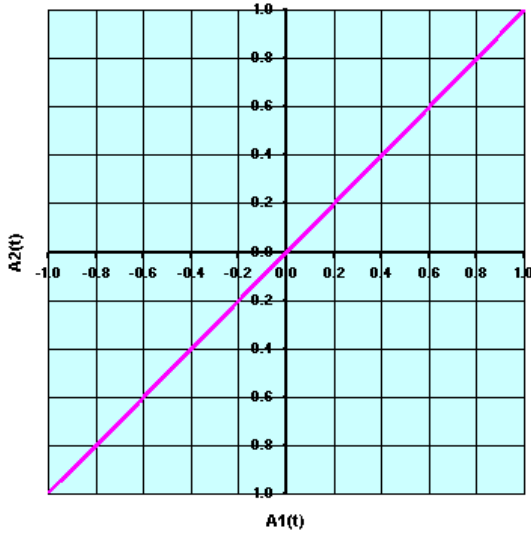


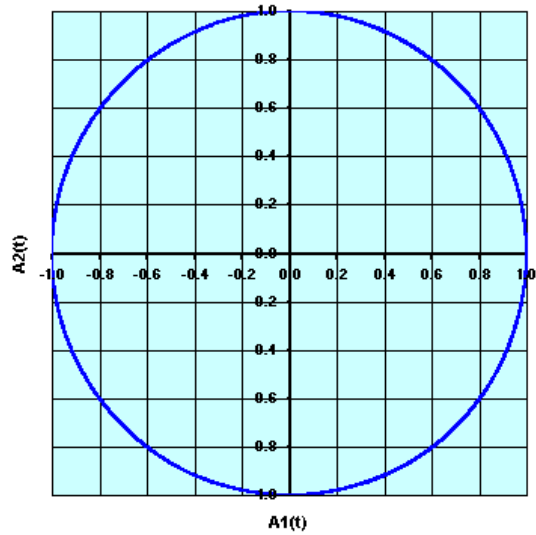
# Examples of Consonance Just Diatonic Scale

## Frequency Ratio 1:1 (Unison)

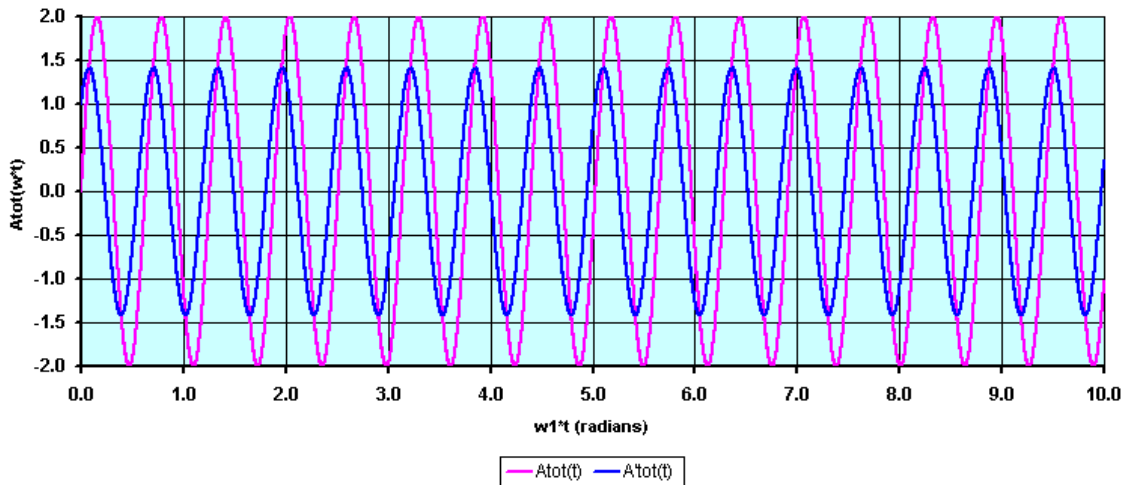
$A_2(t) = A_{20} \sin(w_2 t)$  vs.  $A_1(t) = A_{10} \sin(w_1 t)$   
 $A_{20} = A_{10} = 1.0, f_2/f_1 = 1/1 = 1.000000$



$A_2(t) = A_{20} \cos(w_2 t)$  vs.  $A_1(t) = A_{10} \sin(w_1 t)$   
 $A_{20} = A_{10} = 1.0, f_2/f_1 = 1/1 = 1.000000$

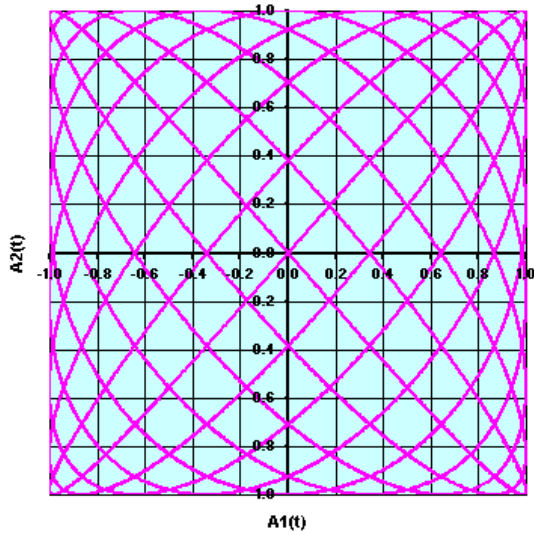


$A_{tot}(t) = A_1(w_1 t) + A_2(w_2 t)$  vs.  $(w_1 t)$   
 $A_{20} = A_{10} = 1.0, f_2/f_1 = 1/1 = 1.000000$

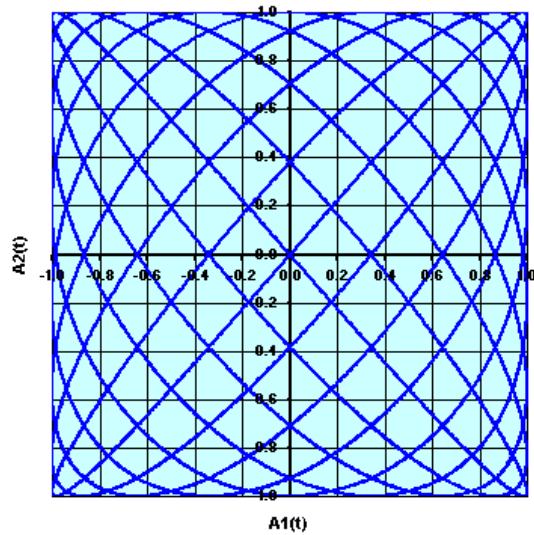


# Frequency Ratio 9:8 = 1.125 (Second)

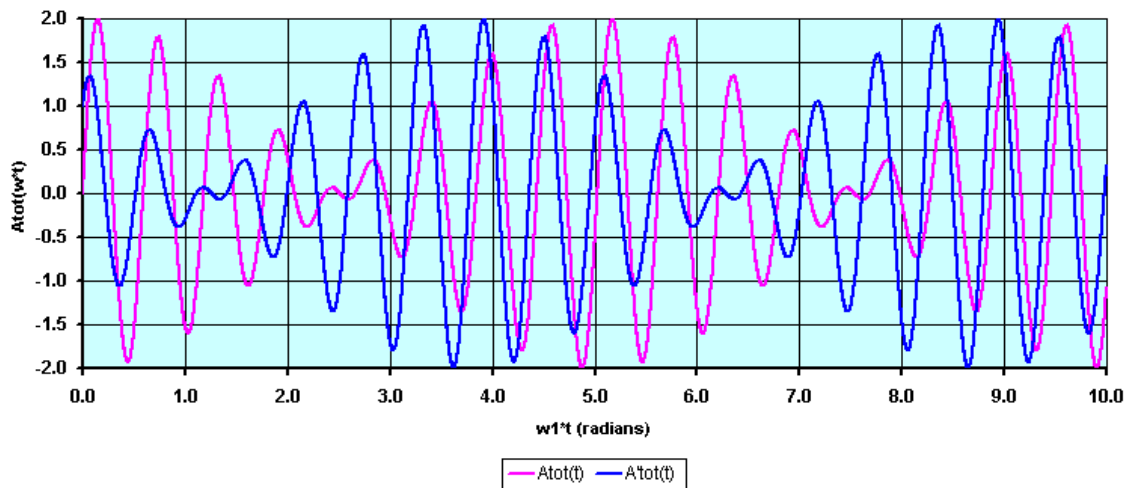
$A_2(t) = A_2 \sin(\omega_2 t)$  vs.  $A_1(t) = A_1 \sin(\omega_1 t)$   
 $A_2 = A_1 = 1.0, f_2/f_1 = 9/8 = 1.125000$



$A_2(t) = A_2 \cos(\omega_2 t)$  vs.  $A_1(t) = A_1 \sin(\omega_1 t)$   
 $A_2 = A_1 = 1.0, f_2/f_1 = 9/8 = 1.125000$

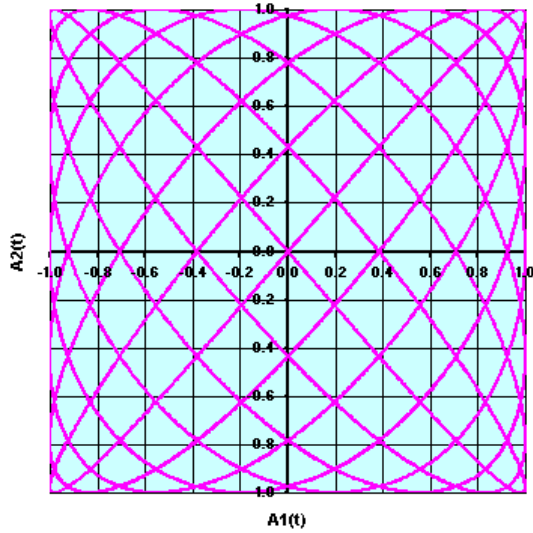


$A_{tot}(t) = A_1(\omega_1 t) + A_2(\omega_2 t)$  vs.  $(\omega_1 t)$   
 $A_2 = A_1 = 1.0, f_2/f_1 = 9/8 = 1.125000$

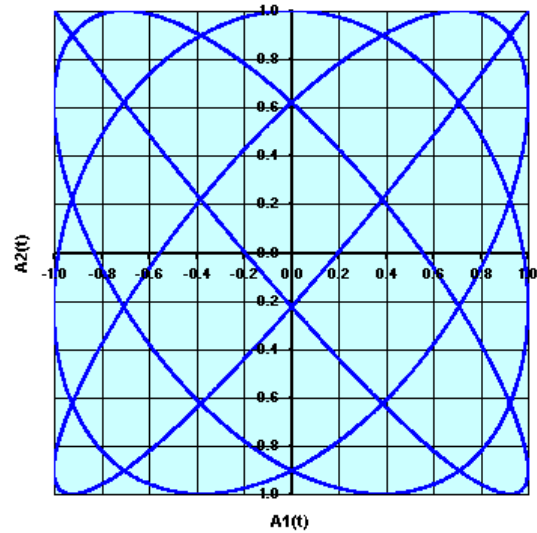


# Frequency Ratio 8:7 = 1.142857142857142857....

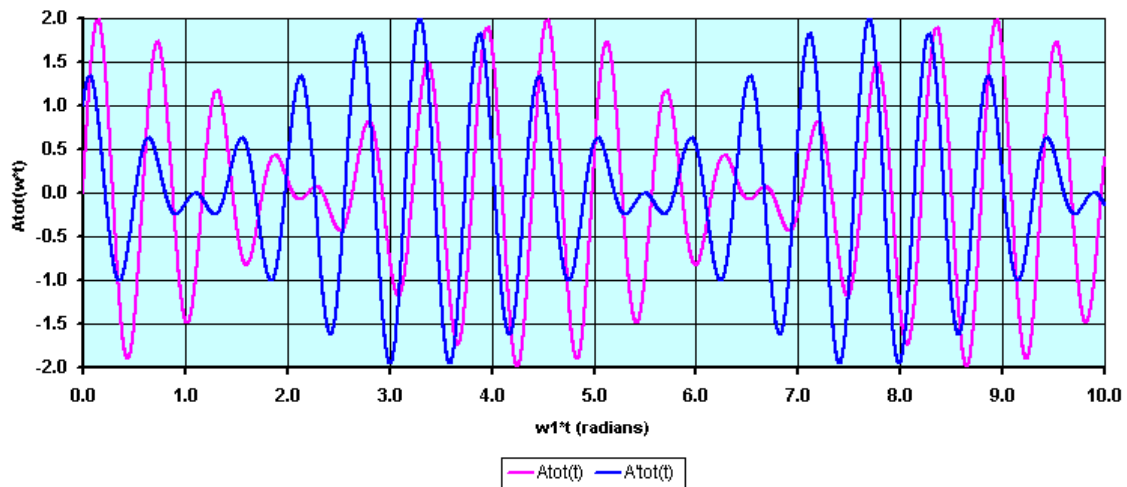
$A_2(t) = A_{20} \sin(w_2 t)$  vs.  $A_1(t) = A_{10} \sin(w_1 t)$   
 $A_{20} = A_{10} = 1.0, f_2/f_1 = 8/7 = 1.1428571$



$A_2(t) = A_{20} \cos(w_2 t)$  vs.  $A_1(t) = A_{10} \sin(w_1 t)$   
 $A_{20} = A_{10} = 1.0, f_2/f_1 = 8/7 = 1.1428571$

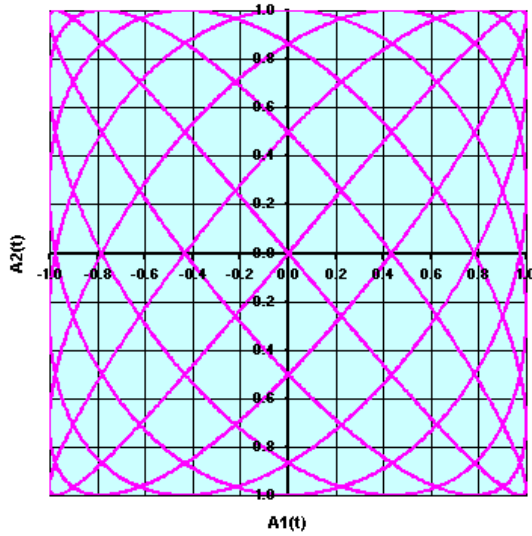


$A_{tot}(t) = A_1(w_1 t) + A_2(w_2 t)$  vs.  $(w_1 t)$   
 $A_{20} = A_{10} = 1.0, f_2/f_1 = 8/7 = 1.1428571$

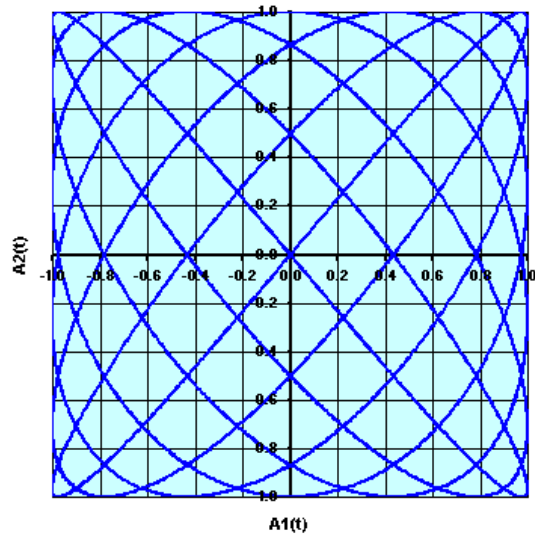


# Frequency Ratio 7:6 = 1.1666666666666666...

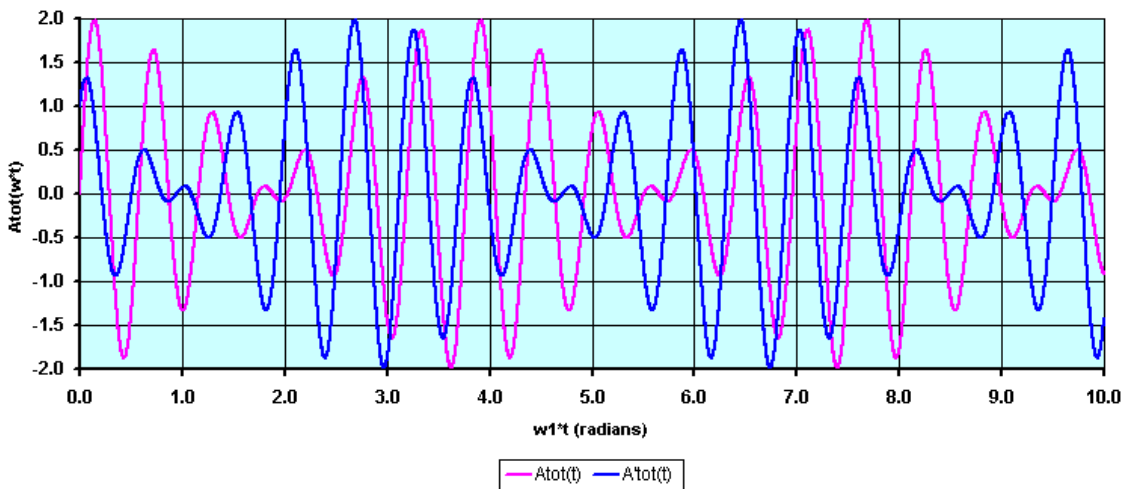
$A_2(t) = A_2 \sin(\omega_2 t)$  vs.  $A_1(t) = A_1 \sin(\omega_1 t)$   
 $A_2 = A_1 = 1.0, f_2/f_1 = 7/6 = 1.166666...$



$A_2'(t) = A_2 \cos(\omega_2 t)$  vs.  $A_1(t) = A_1 \sin(\omega_1 t)$   
 $A_2 = A_1 = 1.0, f_2/f_1 = 7/6 = 1.166666...$

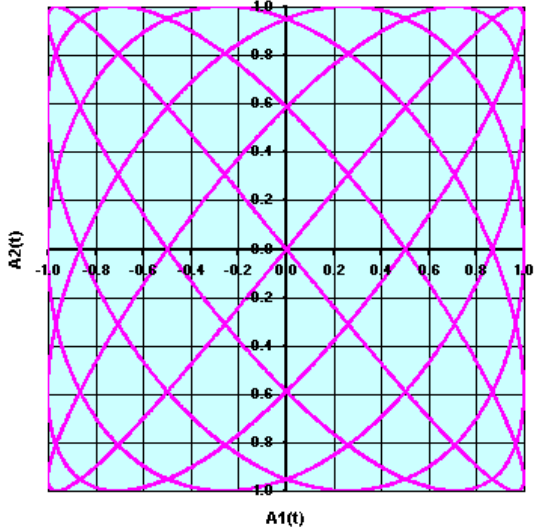


$A_{tot}(t) = A_1(\omega_1 t) + A_2(\omega_2 t)$  vs.  $(\omega_1 t)$   
 $A_2 = A_1 = 1.0, f_2/f_1 = 7/6 = 1.166666...$

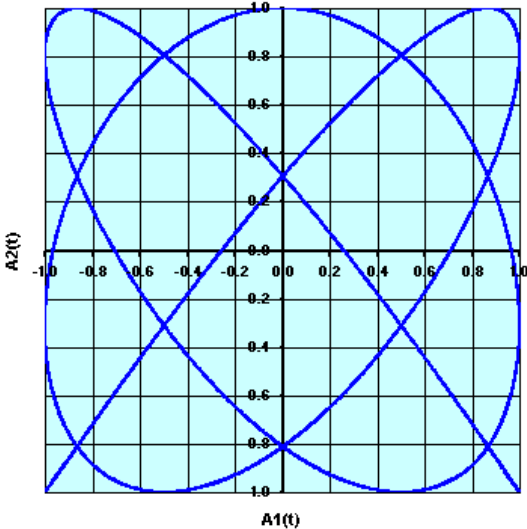


# Frequency Ratio 6:5 = 1.200000 (Minor Third)

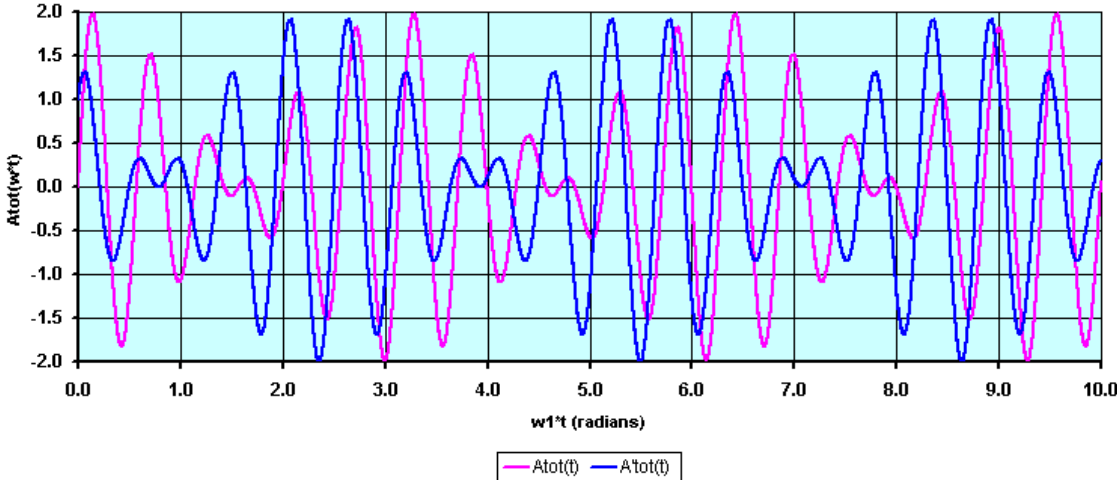
$A_2(t) = A_{20} \sin(w_2 t)$  vs.  $A_1(t) = A_{10} \sin(w_1 t)$   
 $A_{20} = A_{10} = 1.0, f_2/f_1 = 6/5 = 1.200000$



$A'_2(t) = A_{20} \cos(w_2 t)$  vs.  $A_1(t) = A_{10} \sin(w_1 t)$   
 $A_{20} = A_{10} = 1.0, f_2/f_1 = 6/5 = 1.200000$

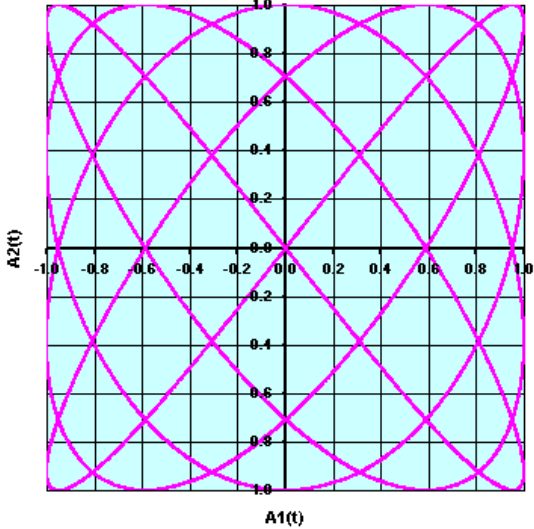


$A_{tot}(t) = A_1(w_1 t) + A_2(w_2 t)$  vs.  $(w_1 t)$   
 $A_{20} = A_{10} = 1.0, f_2/f_1 = 6/5 = 1.200000$

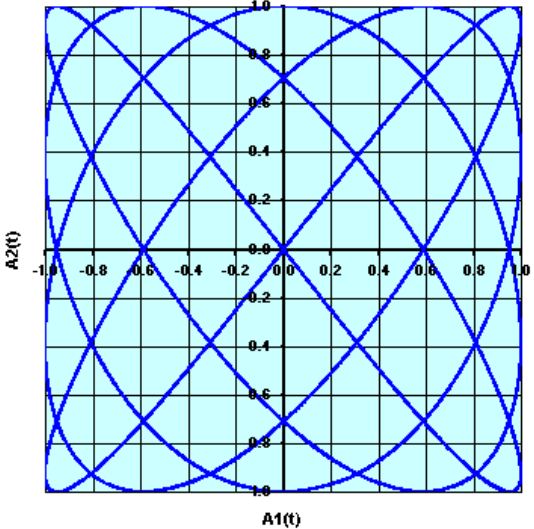


# Frequency Ratio 5:4 = 1.250000 (Major Third)

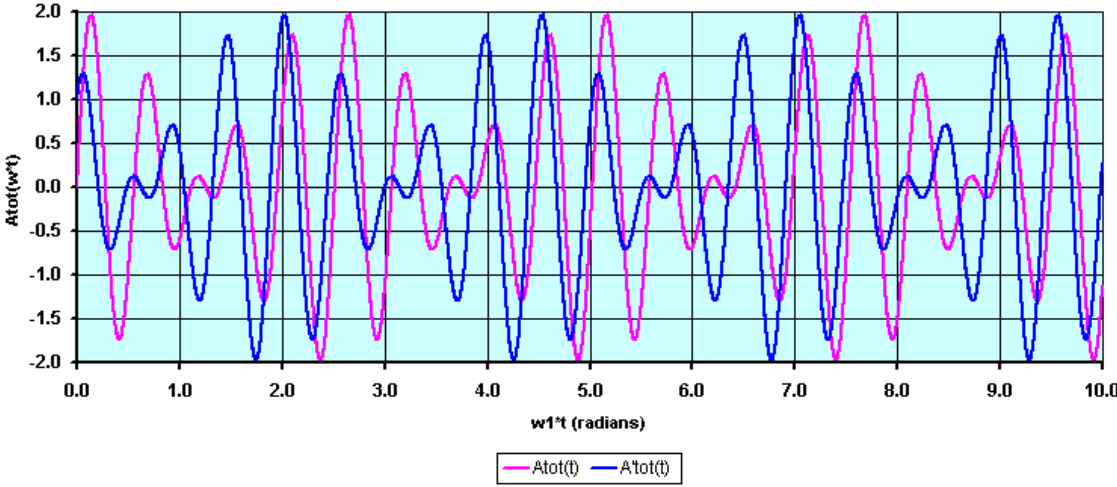
$A_2(t) = A_{20} \sin(w_2 t)$  vs.  $A_1(t) = A_{10} \sin(w_1 t)$   
 $A_{20} = A_{10} = 1.0, f_2/f_1 = 5/4 = 1.250000$



$A_2'(t) = A_{20} \cos(w_2 t)$  vs.  $A_1(t) = A_{10} \sin(w_1 t)$   
 $A_{20} = A_{10} = 1.0, f_2/f_1 = 5/4 = 1.250000$

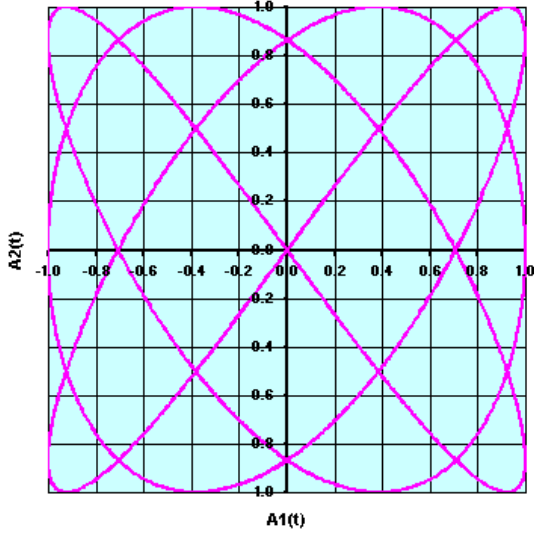


$A_{tot}(t) = A_1(w_1 t) + A_2(w_2 t)$  vs.  $(w_1 t)$   
 $A_{20} = A_{10} = 1.0, f_2/f_1 = 5/4 = 1.250000$

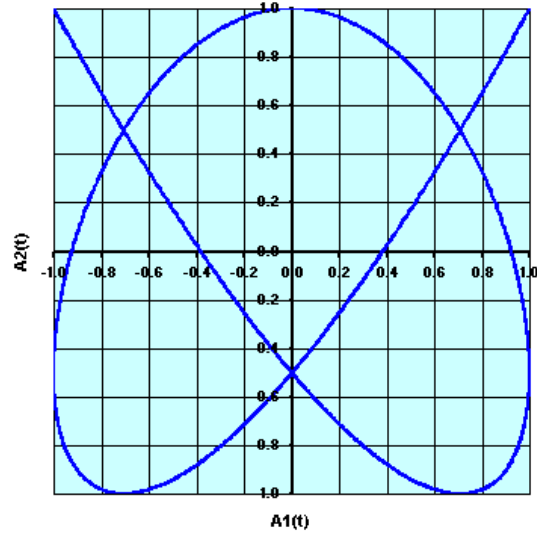


# Frequency Ratio 4:3 = 1.3333333 (Fourth)

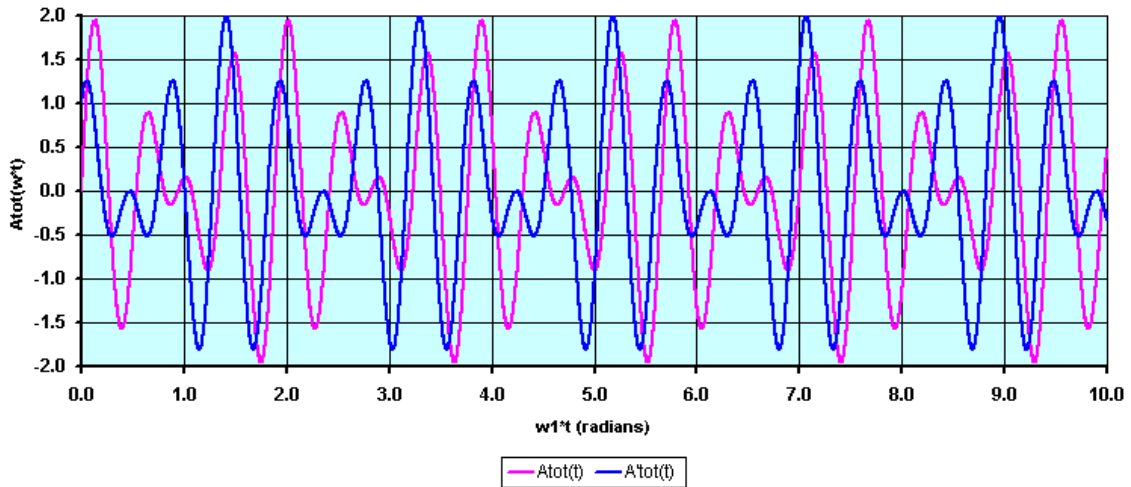
$A_2(t) = A_{20} \sin(w_2 t)$  vs.  $A_1(t) = A_{10} \sin(w_1 t)$   
 $A_{20} = A_{10} = 1.0$ ,  $f_2/f_1 = 4/3 = 1.3333333$



$A_2'(t) = A_{20} \cos(w_2 t)$  vs.  $A_1(t) = A_{10} \sin(w_1 t)$   
 $A_{20} = A_{10} = 1.0$ ,  $f_2/f_1 = 4/3 = 1.3333333$

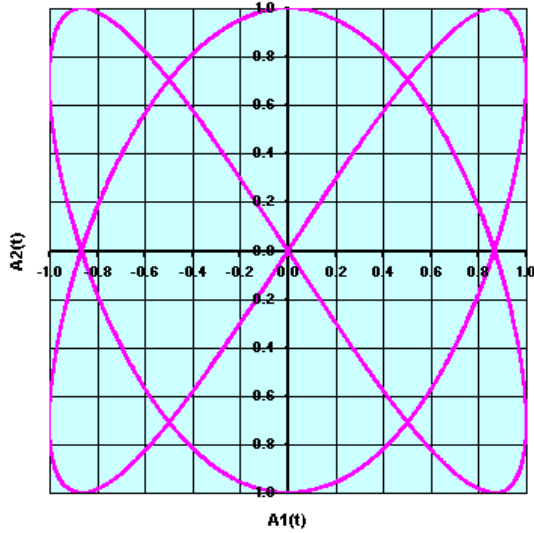


$A_{tot}(t) = A_1(w_1 t) + A_2(w_2 t)$  vs.  $(w_1 t)$   
 $A_{20} = A_{10} = 1.0$ ,  $f_2/f_1 = 4/3 = 1.3333333$

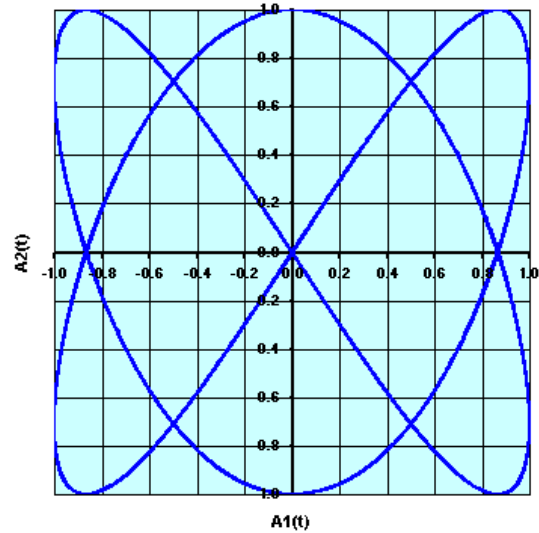


# Frequency Ratio 3:2 = 1.500000 (Fifth)

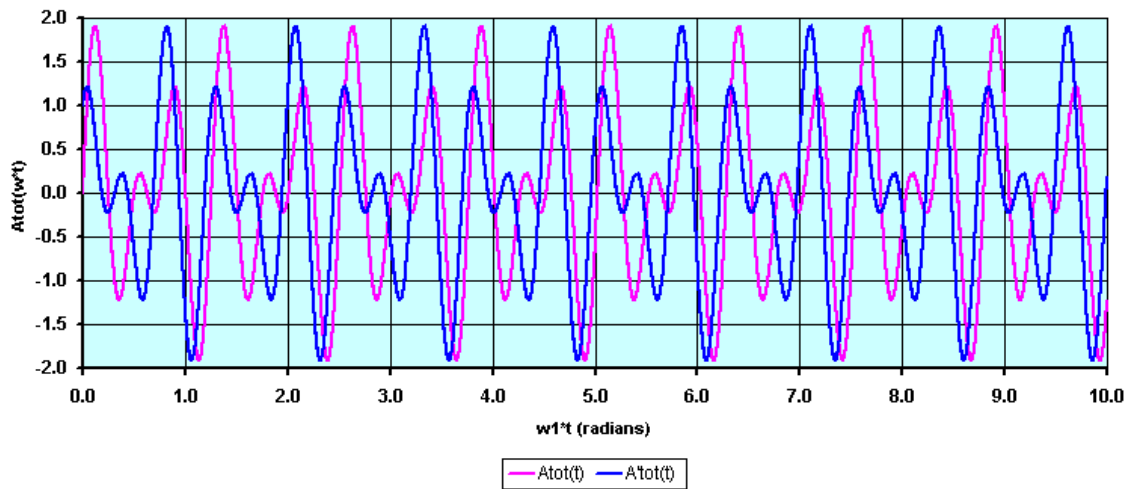
$A_2(t) = A_{20} \sin(w_2 t)$  vs.  $A_1(t) = A_{10} \sin(w_1 t)$   
 $A_{20} = A_{10} = 1.0, f_2/f_1 = 3/2 = 1.5000000$



$A_2'(t) = A_{20} \cos(w_2 t)$  vs.  $A_1(t) = A_{10} \sin(w_1 t)$   
 $A_{20} = A_{10} = 1.0, f_2/f_1 = 3/2 = 1.5000000$



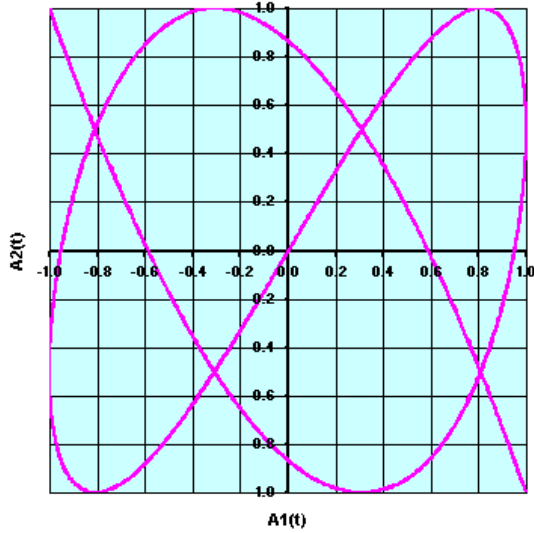
$A_{tot}(t) = A_1(w_1 t) + A_2(w_2 t)$  vs.  $(w_1 t)$   
 $A_{20} = A_{10} = 1.0, f_2/f_1 = 3/2 = 1.5000000$



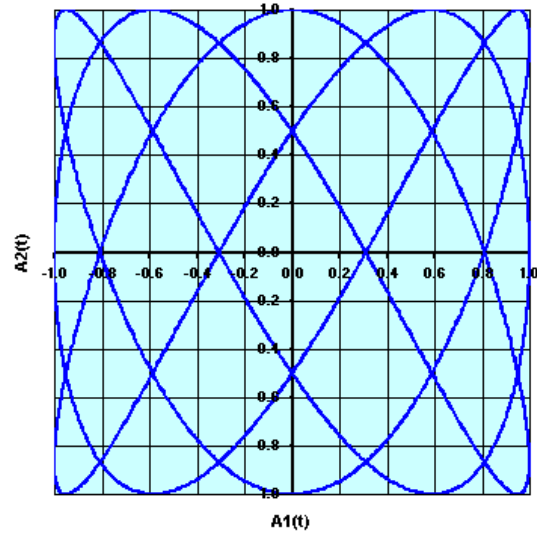


# Frequency Ratio 5:3 = 1.66666... (Sixth)

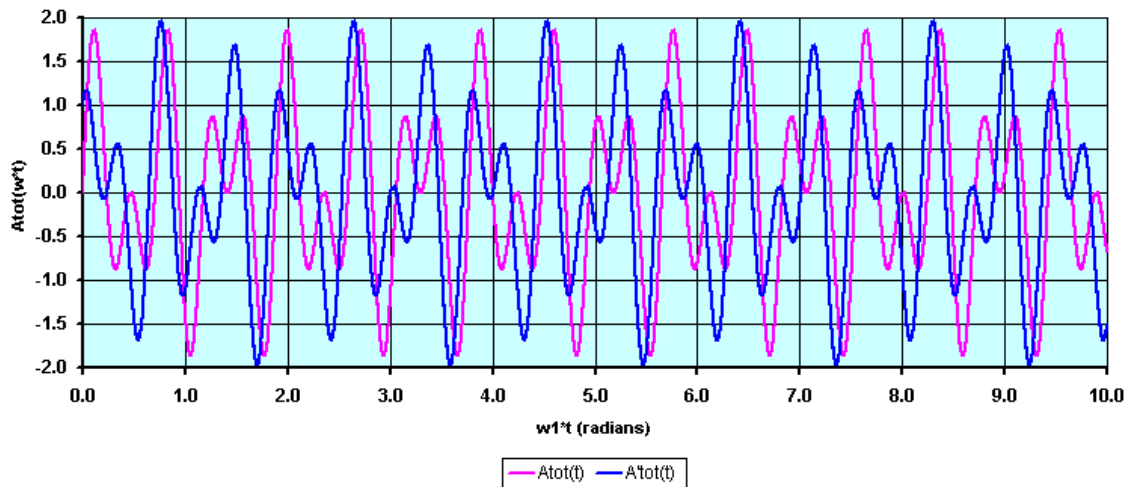
$A_2(t) = A_{20} \sin(w_2 t)$  vs.  $A_1(t) = A_{10} \sin(w_1 t)$   
 $A_{20} = A_{10} = 1.0, f_2/f_1 = 5/3 = 1.6666667$



$A_2'(t) = A_{20} \cos(w_2 t)$  vs.  $A_1(t) = A_{10} \sin(w_1 t)$   
 $A_{20} = A_{10} = 1.0, f_2/f_1 = 5/3 = 1.6666667$

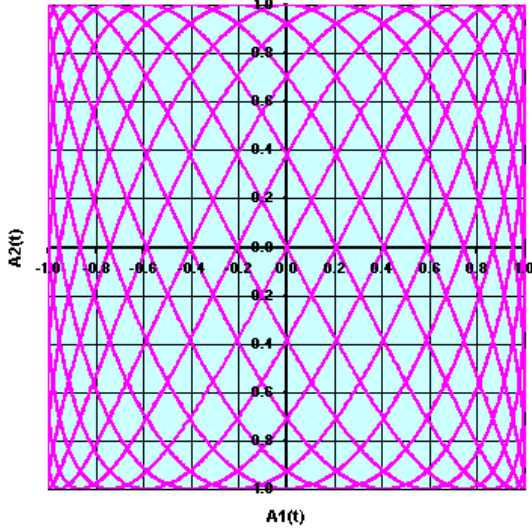


$A_{tot}(t) = A_1(w_1 t) + A_2(w_2 t)$  vs.  $(w_1 t)$   
 $A_{20} = A_{10} = 1.0, f_2/f_1 = 5/3 = 1.6666667$

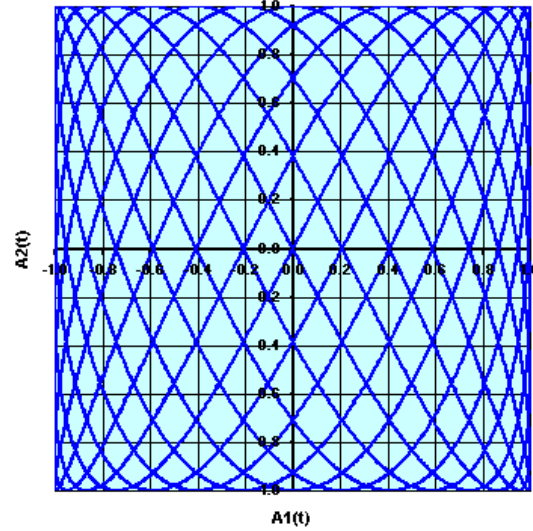


# Frequency Ratio 15:8 = 1.875 (Seventh)

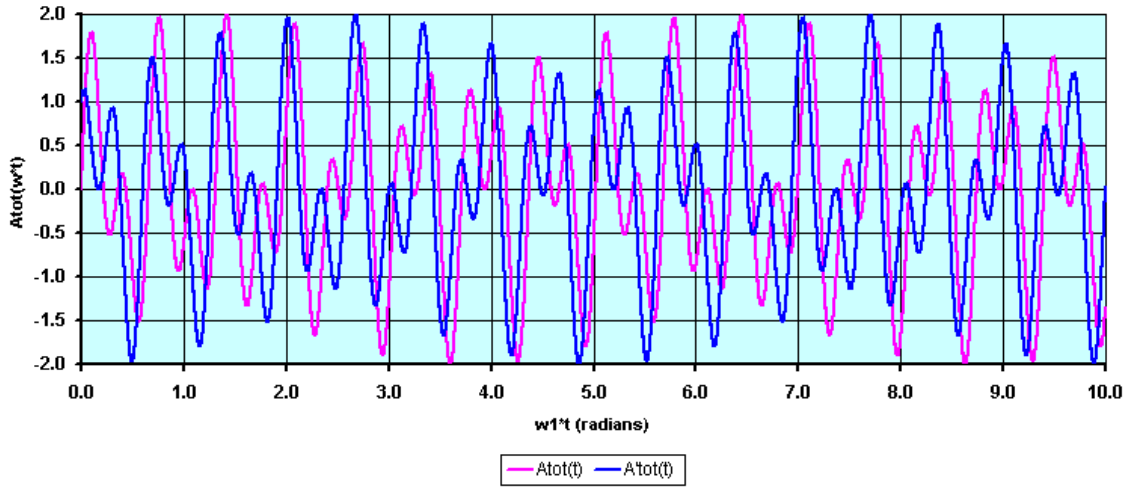
$A_2(t) = A_{20} \sin(w_2 t)$  vs.  $A_1(t) = A_{10} \sin(w_1 t)$   
 $A_{20} = A_{10} = 1.0$ ,  $f_2/f_1 = 15/8 = 1.8750000$



$A_2'(t) = A_{20} \cos(w_2 t)$  vs.  $A_1(t) = A_{10} \sin(w_1 t)$   
 $A_{20} = A_{10} = 1.0$ ,  $f_2/f_1 = 15/8 = 1.8750000$

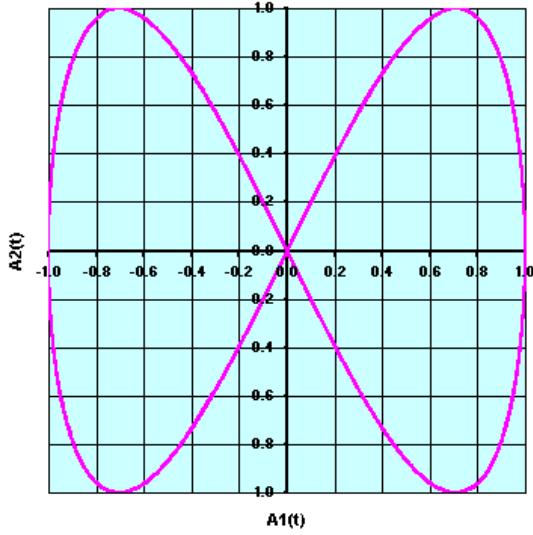


$A_{tot}(t) = A_1(w_1 t) + A_2(w_2 t)$  vs.  $(w_1 t)$   
 $A_{20} = A_{10} = 1.0$ ,  $f_2/f_1 = 15/8 = 1.8750000$

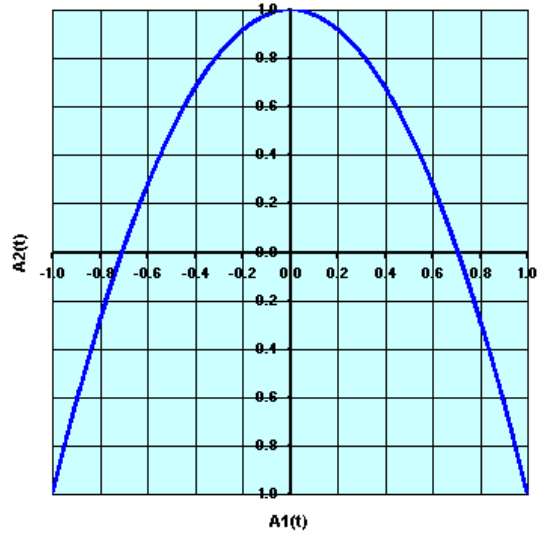


# Frequency Ratio 2:1 (Octave)

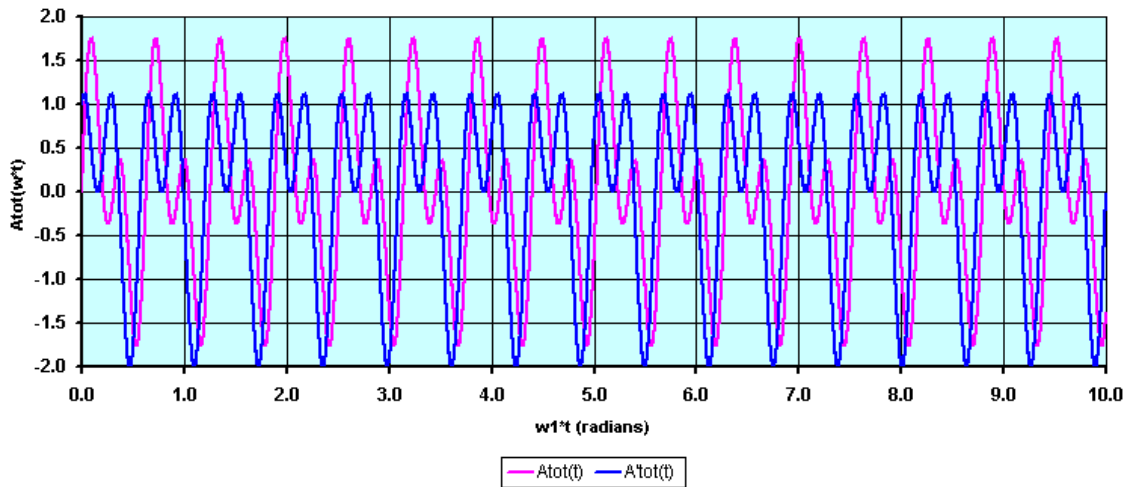
$A_2(t) = A_2 \sin(w_2 t)$  vs.  $A_1(t) = A_1 \sin(w_1 t)$   
 $A_2 = A_1 = 1.0, f_2/f_1 = 2/1 = 2.0000000$



$A_2(t) = A_2 \cos(w_2 t)$  vs.  $A_1(t) = A_1 \sin(w_1 t)$   
 $A_2 = A_1 = 1.0, f_2/f_1 = 2/1 = 2.0000000$

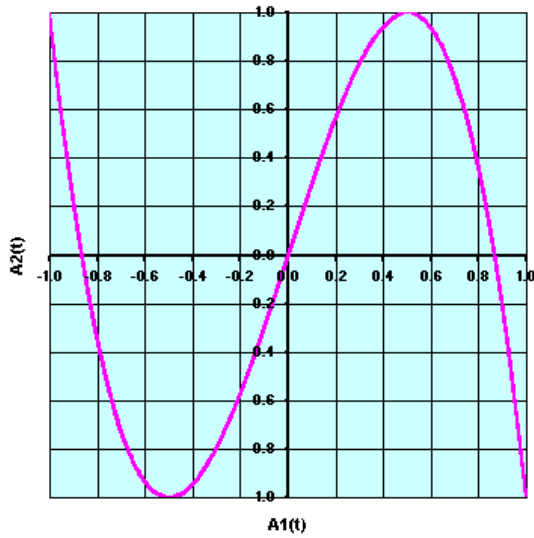


$A_{tot}(t) = A_1(w_1 t) + A_2(w_2 t)$  vs.  $(w_1 t)$   
 $A_2 = A_1 = 1.0, f_2/f_1 = 2/1 = 2.0000000$

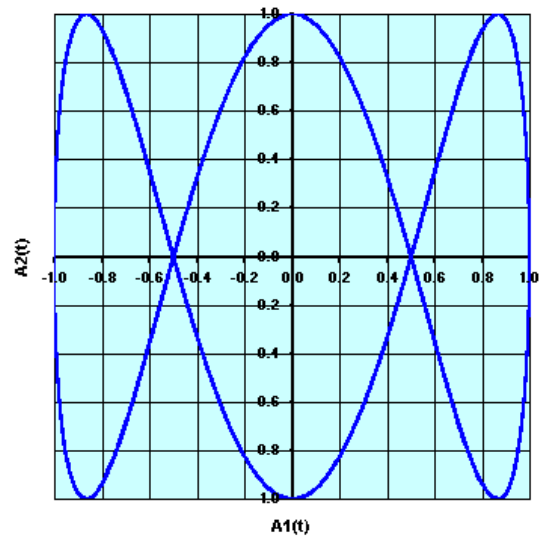


# Frequency Ratio 3:1 (C & Octave G)

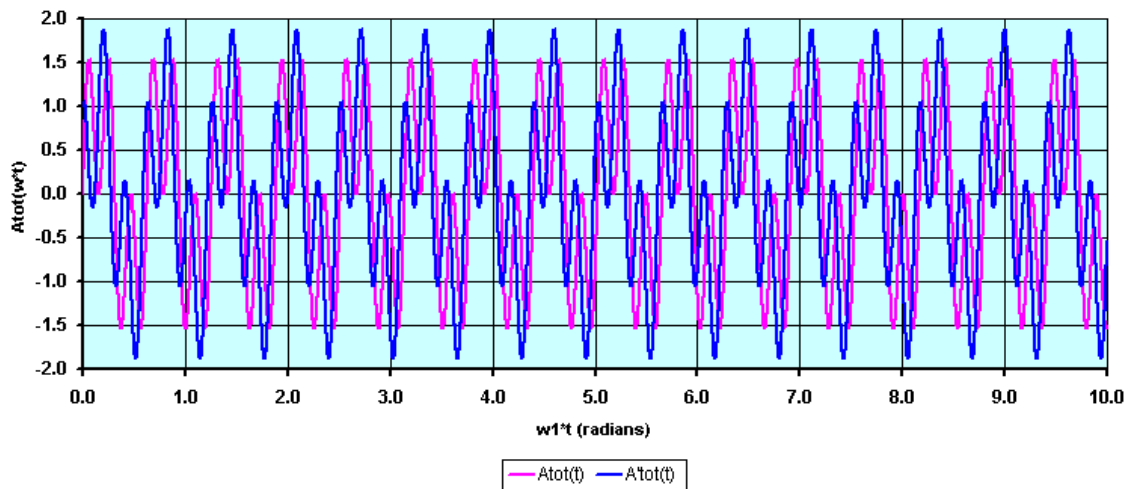
$A_2(t) = A_{20} \sin(w_2 t)$  vs.  $A_1(t) = A_{10} \sin(w_1 t)$   
 $A_{20} = A_{10} = 1.0, f_2/f_1 = 3/1 = 3.0000000$



$A_2(t) = A_{20} \cos(w_2 t)$  vs.  $A_1(t) = A_{10} \sin(w_1 t)$   
 $A_{20} = A_{10} = 1.0, f_2/f_1 = 3/1 = 3.0000000$

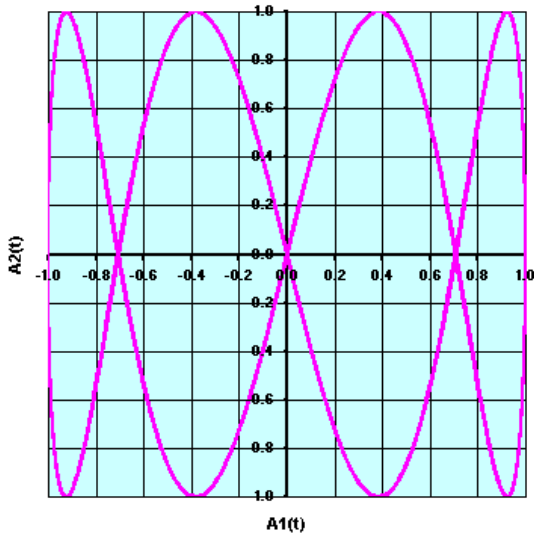


$A_{tot}(t) = A_1(w_1 t) + A_2(w_2 t)$  vs.  $(w_1 t)$   
 $A_{20} = A_{10} = 1.0, f_2/f_1 = 3/1 = 3.0000000$

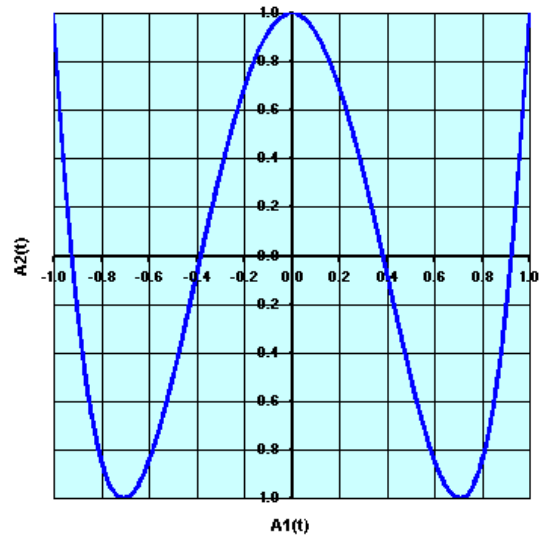


# Frequency Ratio 4:1 (2 Octaves)

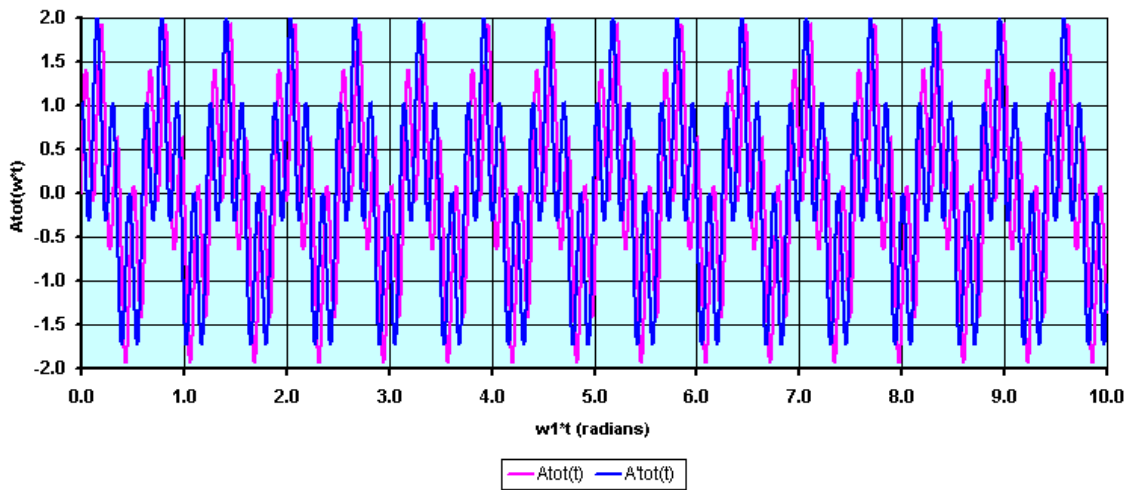
$A_2(t) = A_{20} \sin(w_2 t)$  vs.  $A_1(t) = A_{10} \sin(w_1 t)$   
 $A_{20} = A_{10} = 1.0, f_2/f_1 = 4/1 = 4.0000000$



$A_2(t) = A_{20} \cos(w_2 t)$  vs.  $A_1(t) = A_{10} \sin(w_1 t)$   
 $A_{20} = A_{10} = 1.0, f_2/f_1 = 4/1 = 4.0000000$

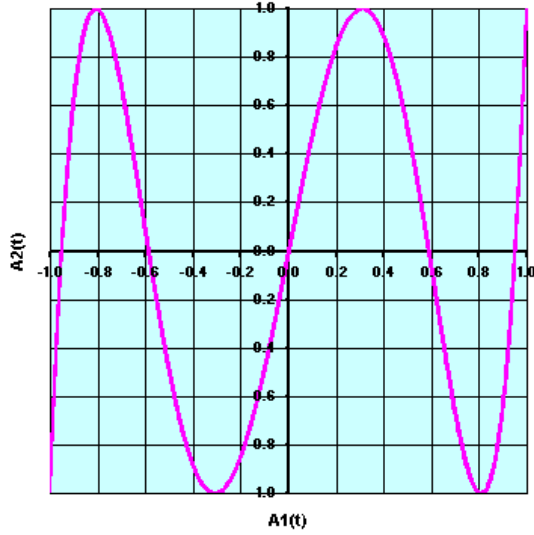


$A_{tot}(t) = A_1(w_1 t) + A_2(w_2 t)$  vs.  $(w_1 t)$   
 $A_{20} = A_{10} = 1.0, f_2/f_1 = 4/1 = 4.0000000$

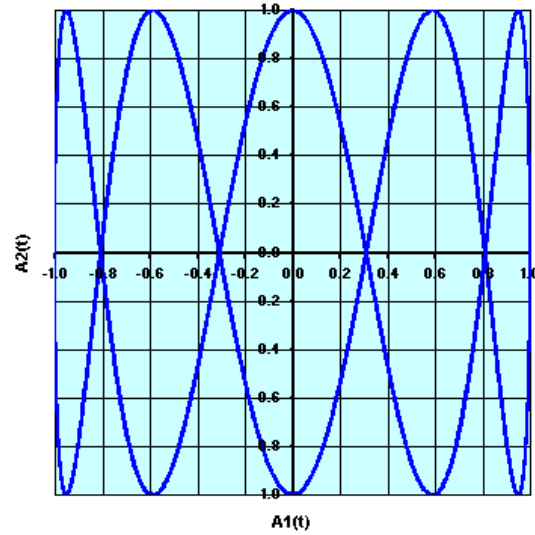


# Frequency Ratio 5:1 (C & 2<sup>nd</sup> Octave E)

$A_2(t) = A_{20} \sin(w_2 t)$  vs.  $A_1(t) = A_{10} \sin(w_1 t)$   
 $A_{20} = A_{10} = 1.0, f_2/f_1 = 5/1 = 5.0000000$



$A_2(t) = A_{20} \cos(w_2 t)$  vs.  $A_1(t) = A_{10} \sin(w_1 t)$   
 $A_{20} = A_{10} = 1.0, f_2/f_1 = 5/1 = 5.0000000$



$A_{tot}(t) = A_1(w_1 t) + A_2(w_2 t)$  vs.  $(w_1 t)$   
 $A_{20} = A_{10} = 1.0, f_2/f_1 = 5/1 = 5.0000000$

