MATH5 WORKSHEET : Mode excitation by percussion.

4/27/07
Bmmith

Two Modes of a bar (eg. xylophone bar) are as follows: (extremes of vibration shown)

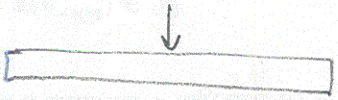
mode a

f_a = 300Hz

mode b

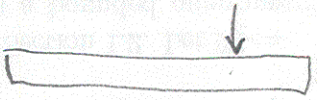
f_b = 700Hz

A) Label the nodes and antinodes for each mode.

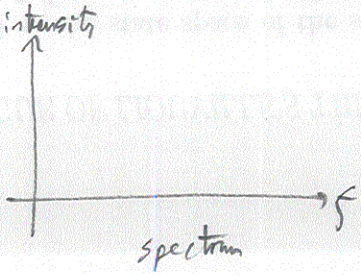
B) If you hit in the center  which mode(s) are excited?

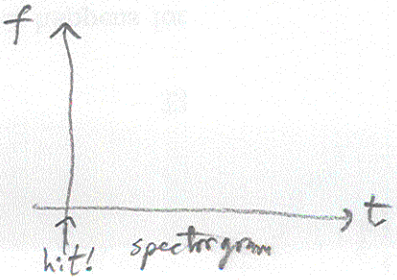
What partials do you expect to hear?

Are a_a, a_b each large, small or zero?

C) If you hit about 75% of the way along.  which answer the same questions.

D) If you hit at a general place, sketch the spectrum heard & the spectrogram:

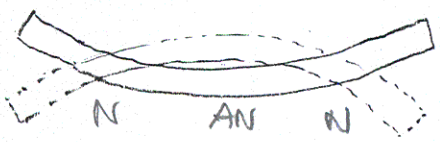




MATHS WORKSHEET : Mode excitation by percussion.

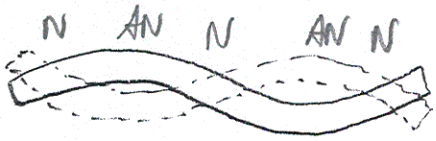
4/27/07
Barnett

Two Modes of a bar (eg. xylophone bar) are as follows: (extremes of vibration shown)



mode a

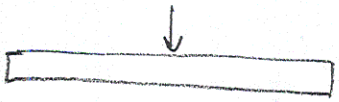
$f_a = 300\text{Hz}$



mode b

$f_b = 700\text{Hz}$

A) Label the nodes (N) and antinodes (AN) for each mode.

B) If you hit in the center  which mode(s) are excited?

mode a yes, but not mode b.

What partials do you expect to hear?

300Hz

Are α_a, α_b each large, small or zero?

α_a = large
α_b = zero

C) If you hit about 75% of the way along. 

answer the same questions.

since a his mode there, expect α_a = zero, but α_b = large since mode b is large then.

Hear 700Hz

D) If you hit at a general place, sketch the spectrum heard & the spectrogram: