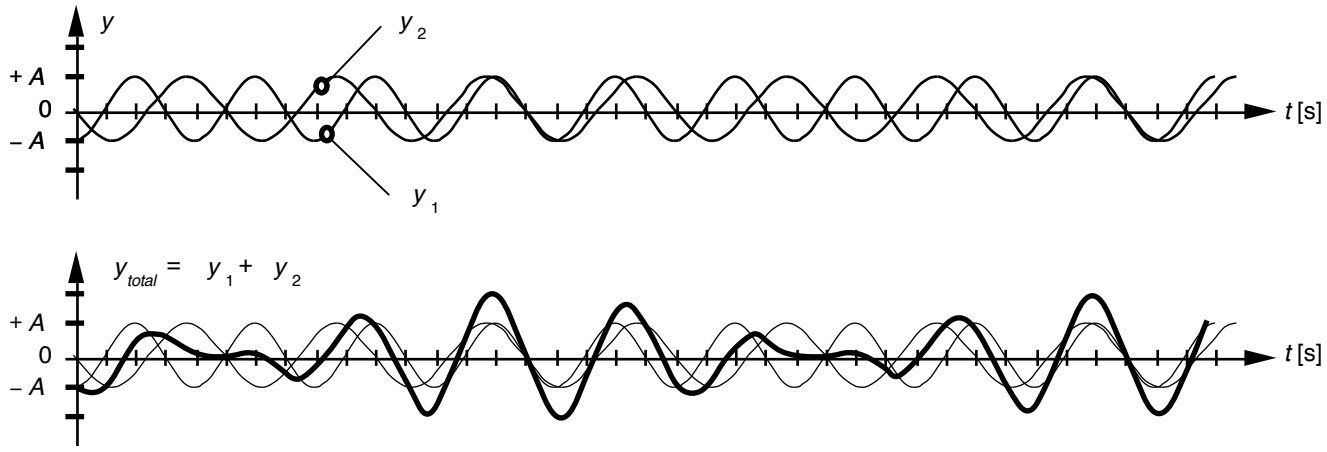
Name_____

Consider these two waves. The bold line represents the superposition of these two waves.



1. Determine the frequencies f_1 and f_2, in Hz (as decimal values; don't use fraction values).

2. List the times where: (a) $\Delta\theta$ = even·π; (b) $\Delta\theta$ = odd·π. Then specify these times on the graphs above.

Determine the "beat" period and frequency of these waves.

3. How long (in sec) does it take for $\Delta\theta$ to go through one cycle of constructive-destructive-constructive interference on the graph? How frequently (in Hz) do these two waves go through constructive-destructive-constructive interference?

Determine the "pitch" period and frequency of these waves.

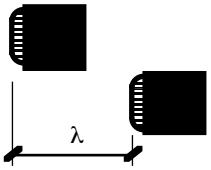
4. While these waves are superposing constructively, what is their period (in sec) on the graph? Their frequency (in Hz)? (This is "wiggliness" of the bold line—what your ear hears, after these waves add together.)

Match these experimental set-ups below with the cases (I)-(IV) on the next page.
Indicate whether you would observe constructive or destructive interference.

A. Plug two speakers into the *same* function generator, wired the same way, standing face to face.

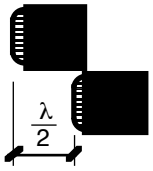
(I-IV?)____ (C or D?)____

B. Plug two speakers into the *same* wave function generator, wired the same way, both facing you, but one speaker a full wavelength in front of the other.



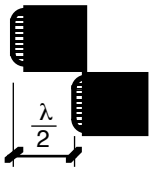
(I-IV?)____ (C or D?)____

C. Plug two speakers into the *same* wave function generator, wired oppositely, both facing you, but one speaker a half wavelength in front of the other.



(I-IV?)____ (C or D?)____

D. Plug two speakers into the *same* wave function generator, wired the same way, both facing you, but one speaker a half wavelength in front of the other.

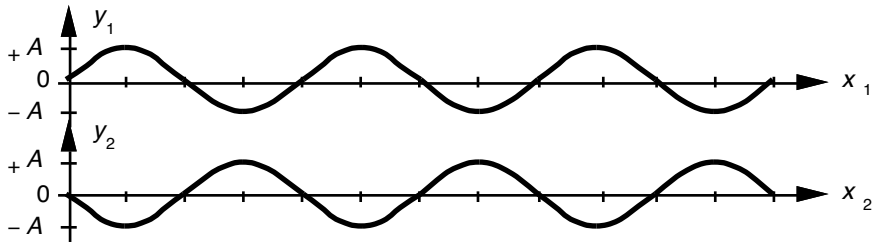


(I-IV?)____ (C or D?)____

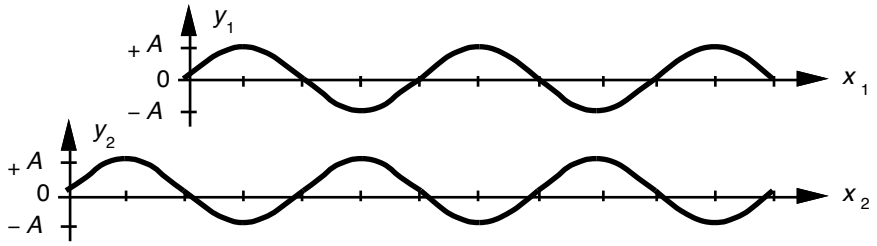
E. Plug two speakers into the *same* wave function generator, wired oppositely, standing face to face.

(I-IV?)____ (C or D?)____

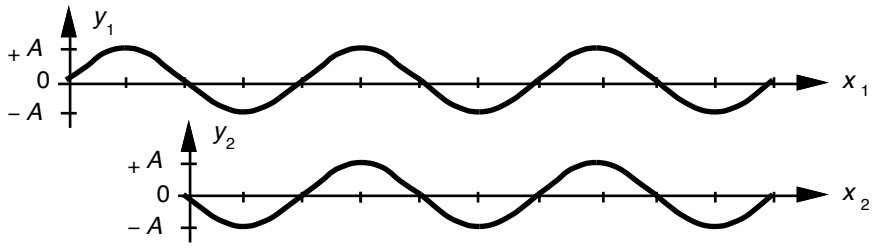
I.


y1
+A
0
−A
x1
y2
+A
0
−A
x2

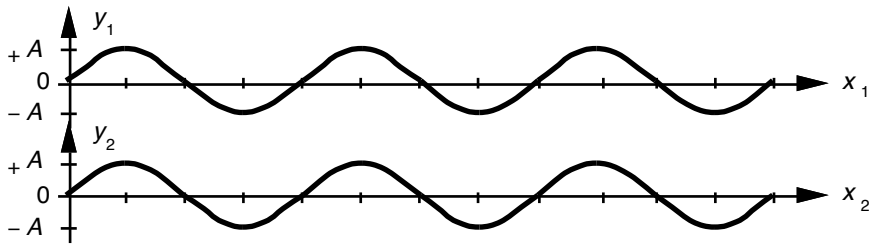
II.


y1
+A
0
−A
x1
y2
+A
0
−A
x2

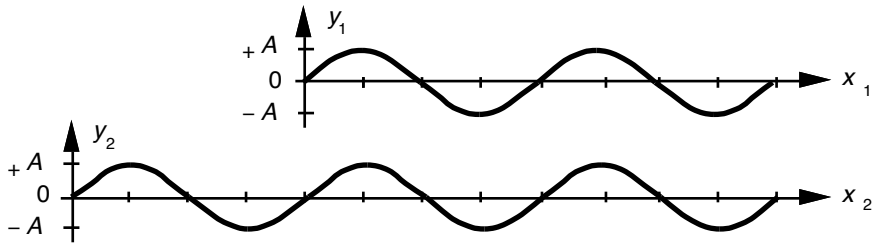
III.


y1
+A
0
−A
x1
y2
+A
0
−A
x2

IV.


y1
+A
0
−A
x1
y2
+A
0
−A
x2

V.


y1
+A
0
−A
x1
y2
+A
0
−A
x2