

Wave Interference

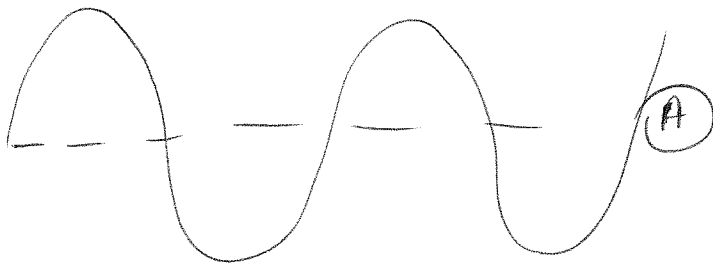


These 2 waves will overlap (superimpose)
+ create one resultant wave and then
keep going



They are not destroyed by passing
over each other

Effect of amplitude



If these waves
(A+B) were ...

- water, (A) would be more powerful



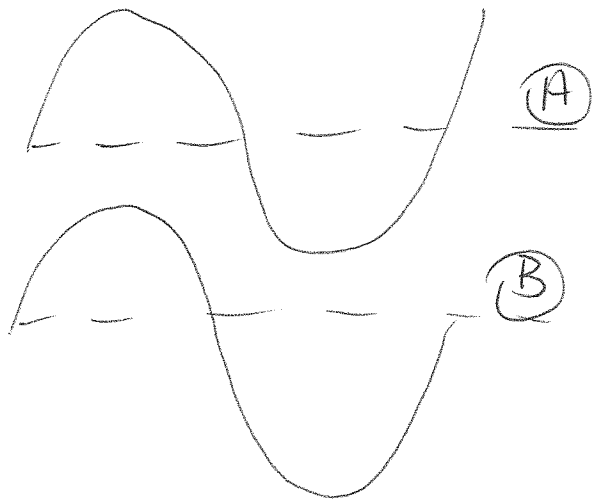
- sound, (A) would be louder

- light, (A) would be brighter

(C) If (C) were

- water - it would be still (no power)
- sound - it would be silent (no sound)
- light - it would be dark (no light)

Wave Shifts

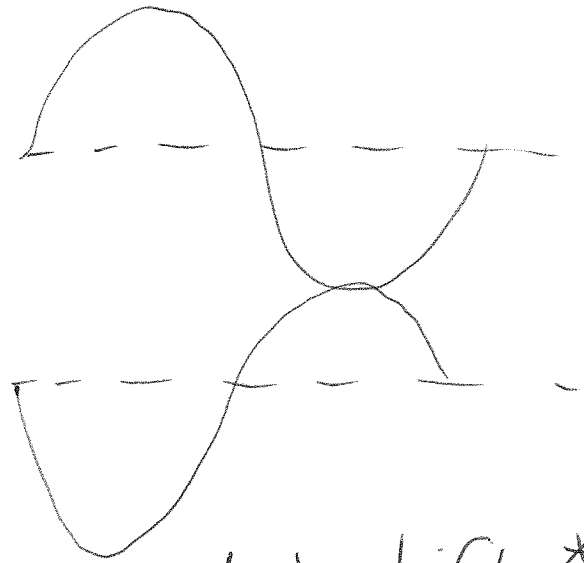


These waves "line up"
We say they are
* in phase *

They will undergo
constructive interference

pushing the crests even
higher ; troughs even
lower.

∴ sound waves get louder
light waves get brighter
water waves get more powerful



* $\frac{1}{2} \lambda$ shift *

The crest has moved \rightarrow
 $\frac{1}{2} \lambda$.

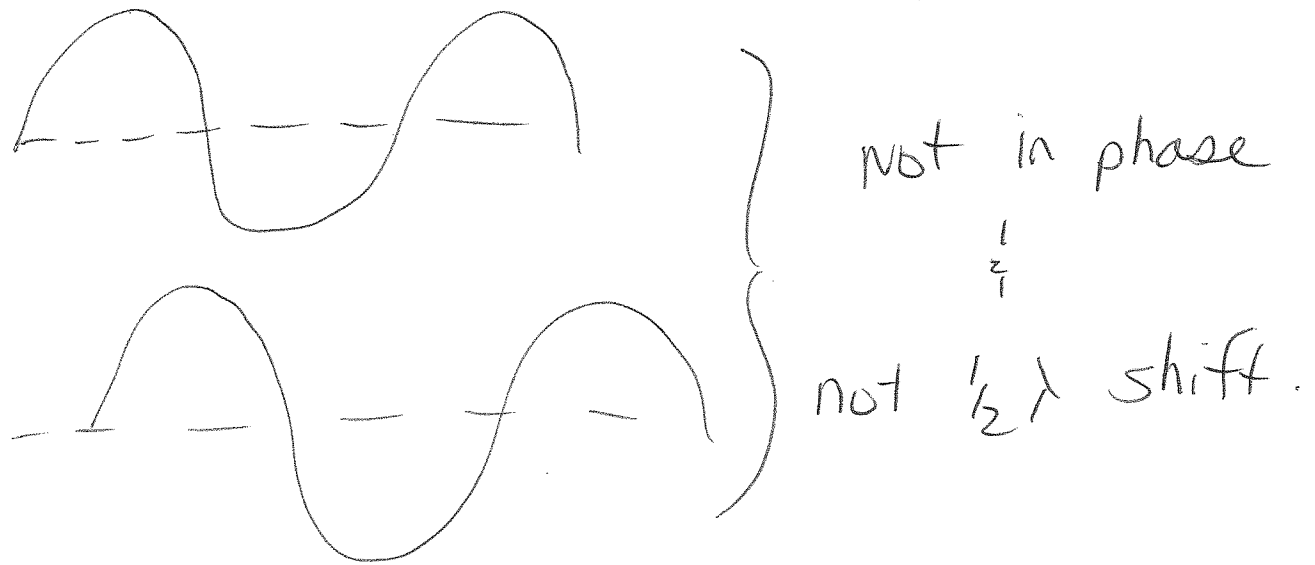
Now crests line up with
troughs + cancel each
other out.

This is destructive
interference

The result is NO wave

- NO sound
- NO light
- NO water wave

In between these 2 "perfect" scenarios
are waves that are just "out of phase"



This will undergo both
constructive \neq destructive interference

* See hand-out on Wave Superposition
(constructive \neq destructive
interference)