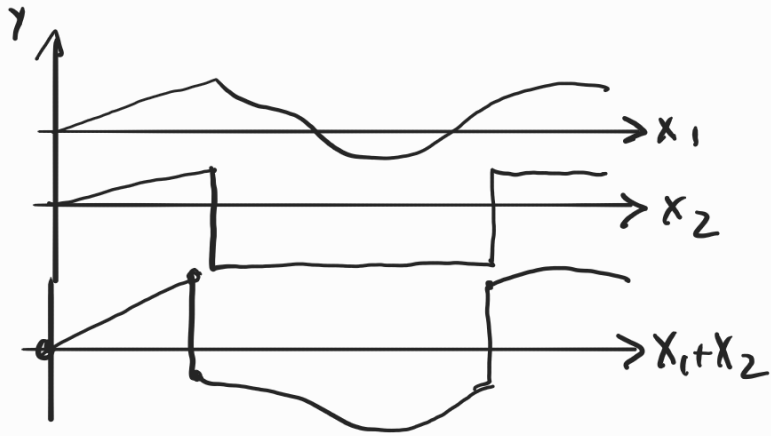


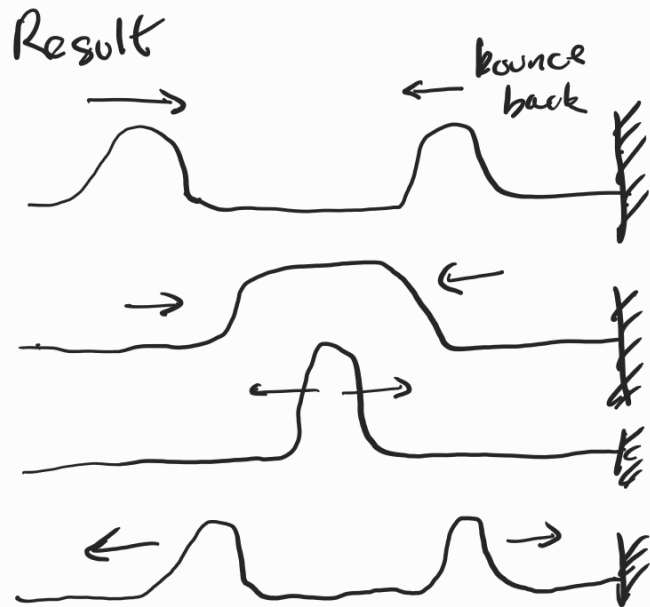
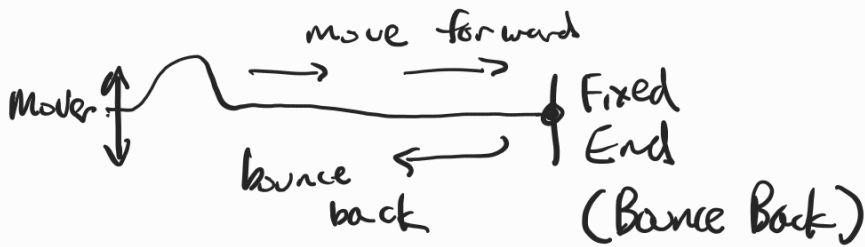
3.3 Interference and Stationary Waves 駐波

疊加
Superposition: 2 or more waves could be added together

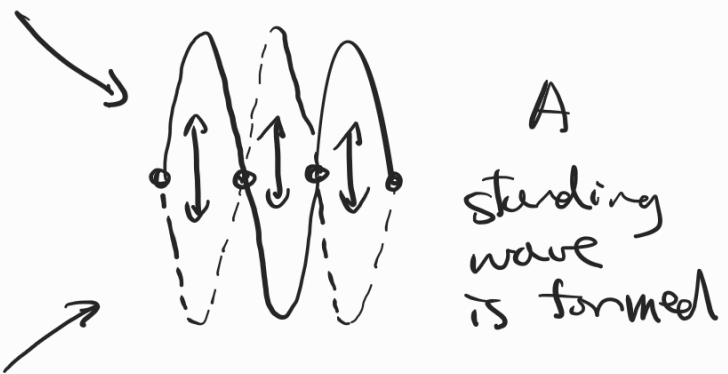
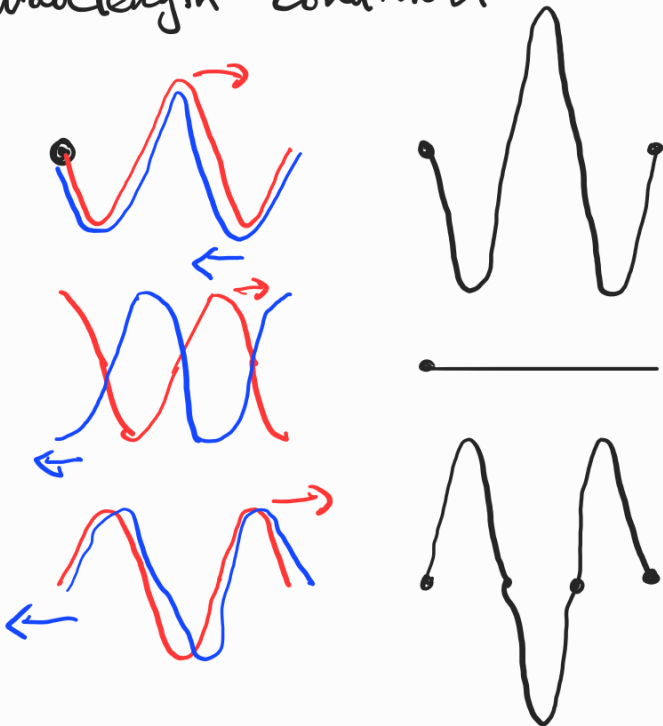


* When 2 travelling waves meet + displacement is the sum of each travelling wave

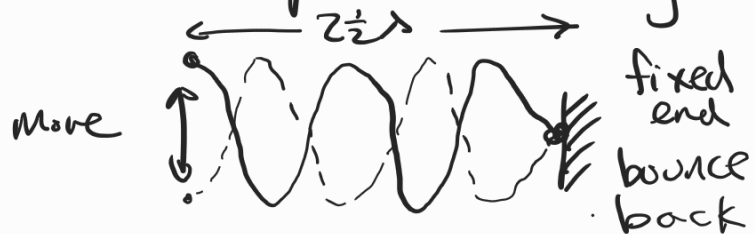
* The addition will not affect individual travelling



(standing)
STATIONARY waves are formed under certain wavelength condition

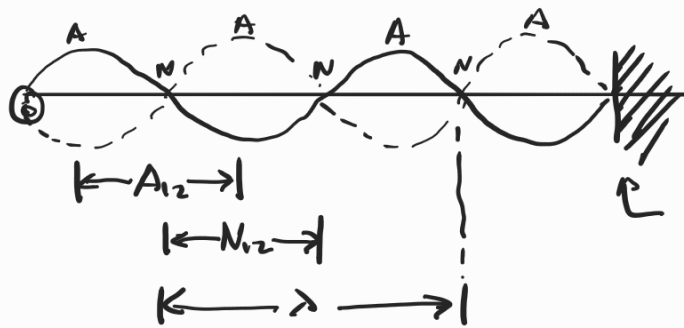


How to produce a standing wave?



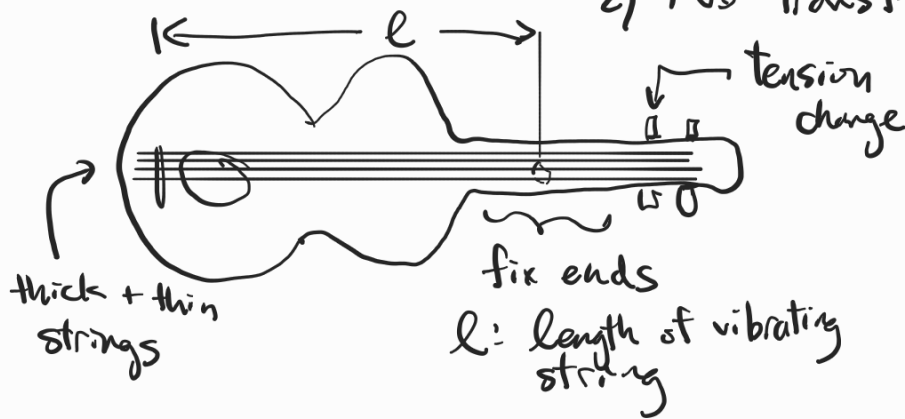
Strings (Violin, guitar, Cello)

- * 2 ends are fixed
- * nodes and antinodes are formed
- * fixed frequency (tune up/down by string mass and tension)
- * λ is twice the length of node/antinode distance



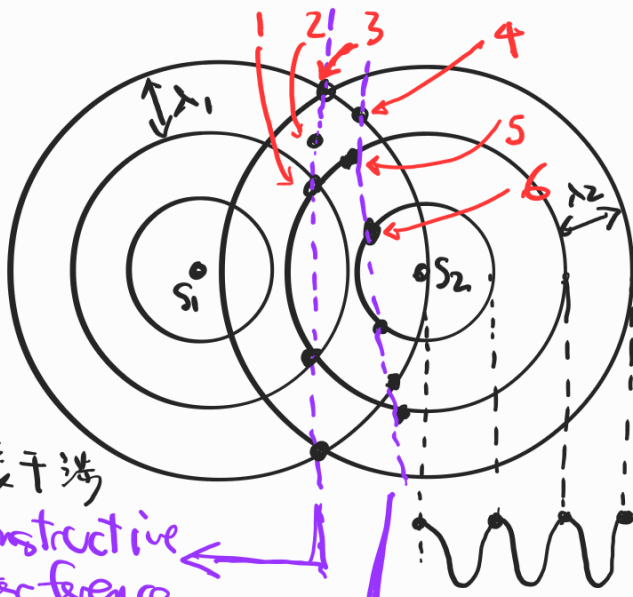
波腹
A: antinode
N: node
波節

Standing Waves: 1) Stationary A and N. No travelling
2) No transfer of energy



Standing Wave
Interference
Pattern
between S_1, S_2

干涉
Interference of 2D waves



$$\text{crest} + \text{crest} = \text{crest} \quad 1, 3$$

$$\text{trough} + \text{trough} = \text{trough} \quad 2$$

$$\text{crest} + \text{trough} = \text{flat} \quad 4, 6$$

$$\text{trough} + \text{crest} = \text{flat} \quad 5$$

完

constructive interference

destructive interference

相消干涉

相長干涉

