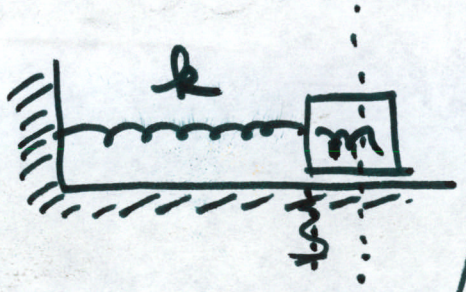
Gabe

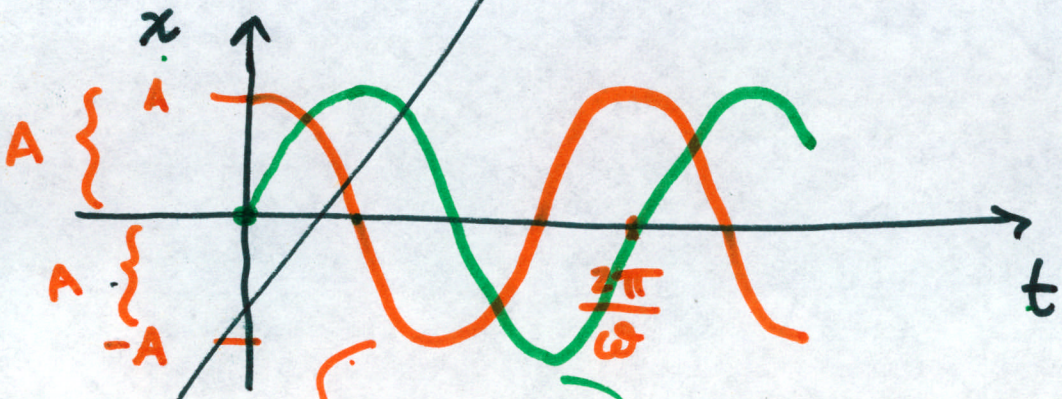
$$x(t) = A\cos(\omega t + \phi)$$

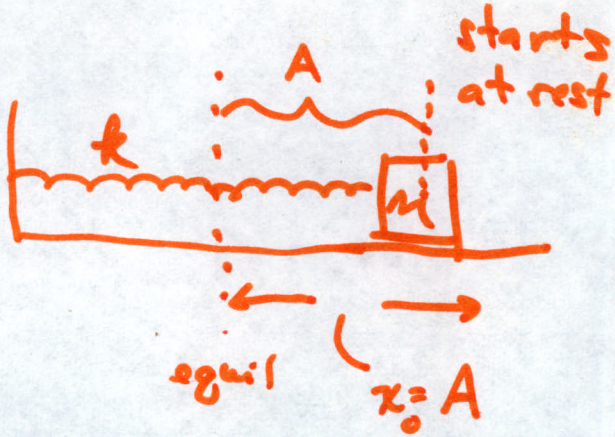
"phase"

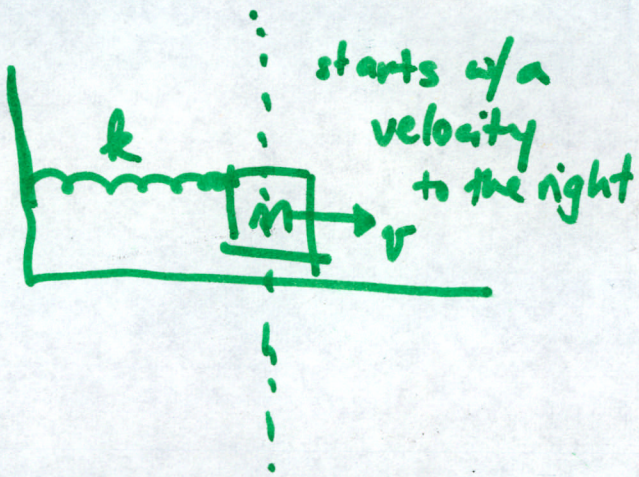
amplitude of the oscillation

$\omega^2 = \frac{k}{m}$









$x = A\cos(\omega t)$

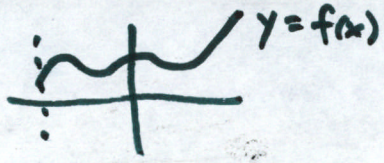
$x = A\sin(\omega t)$

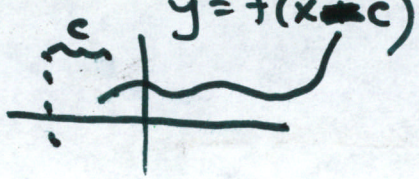
OR

$x = A\cos(\omega t + \frac{\pi}{2\omega})$

compare: $\phi = 0$

Recall from H.S.:

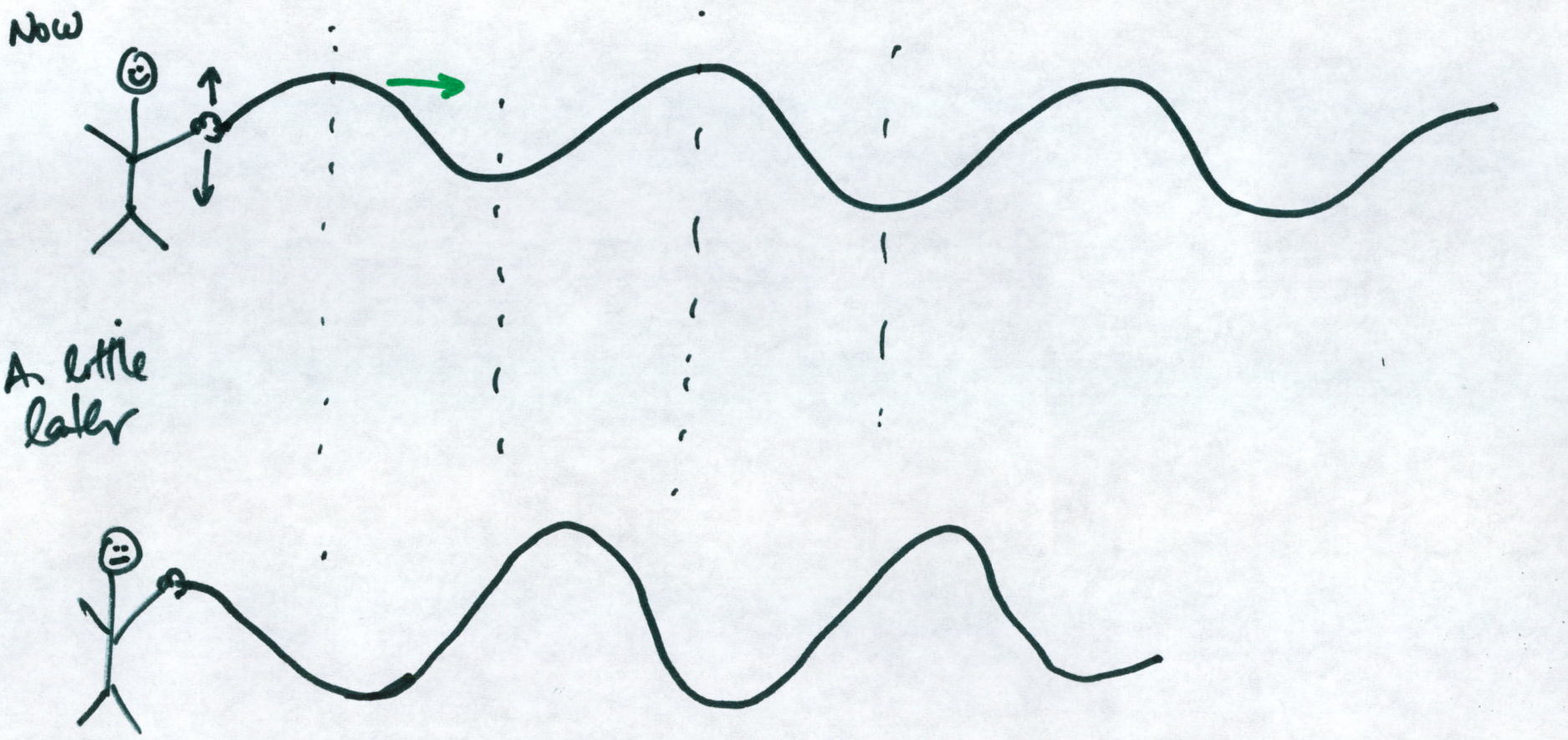




Guitar strings

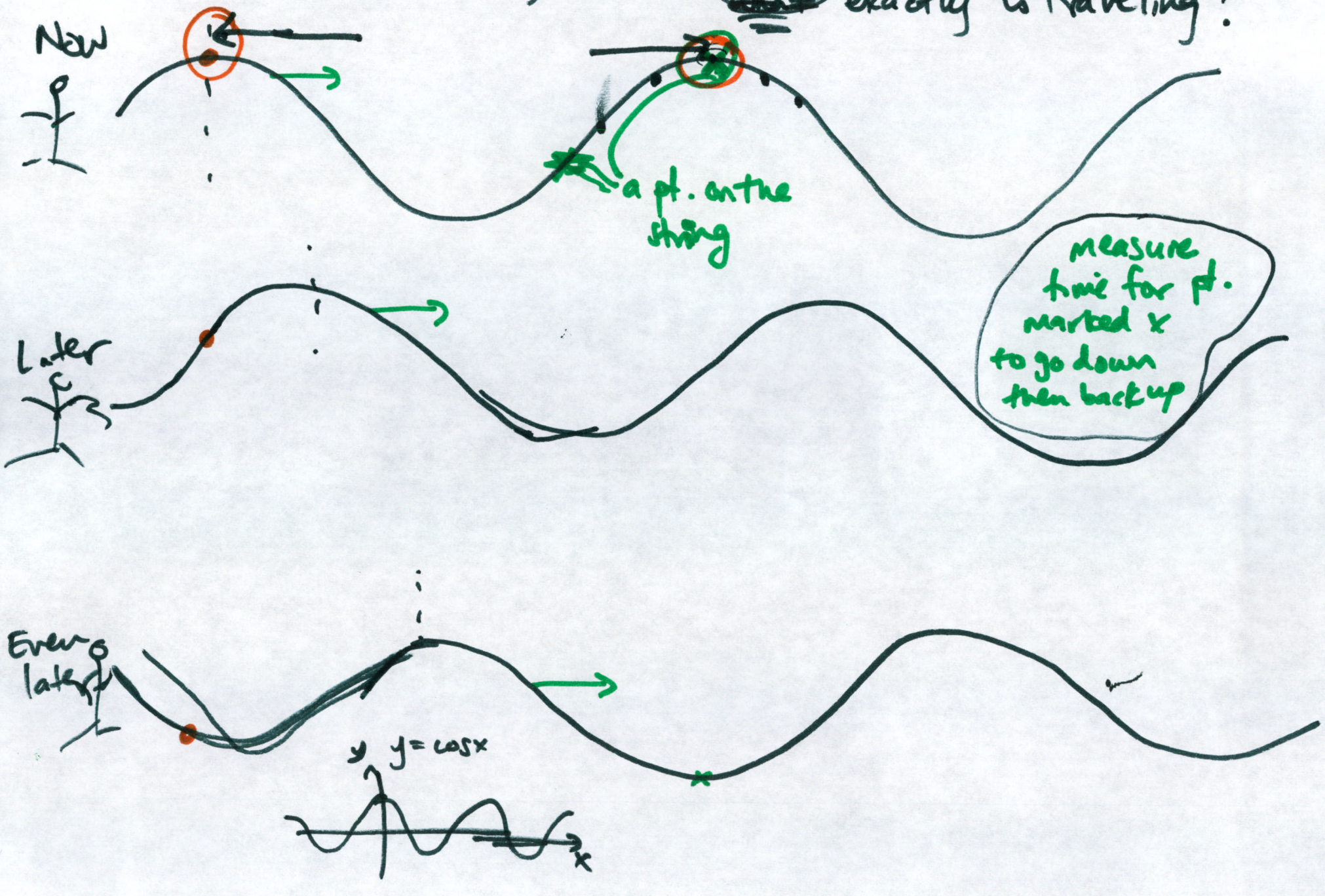
forget the guitar for a second....

just focus on strings



We say that "there's a wave traveling on the string".

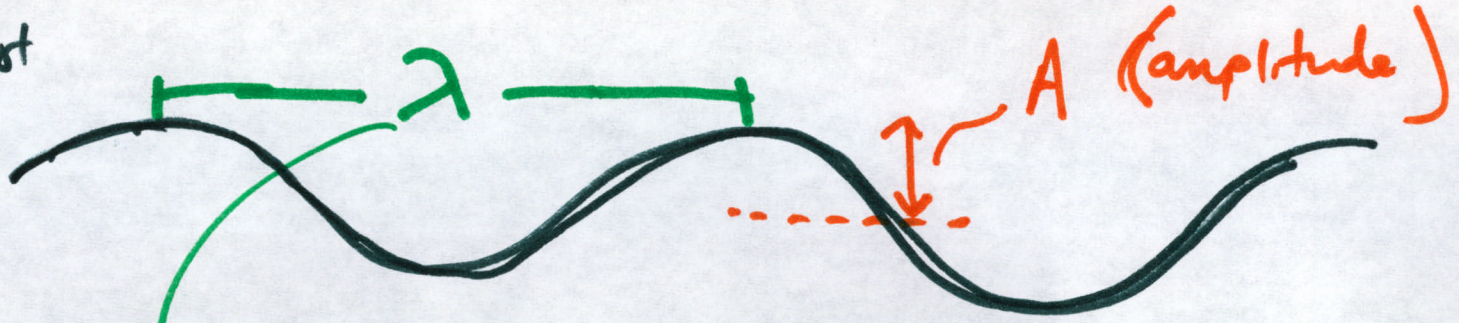
WHAT exactly is traveling?



Pattern itself as being the thing that moves
(spatial profile of string)

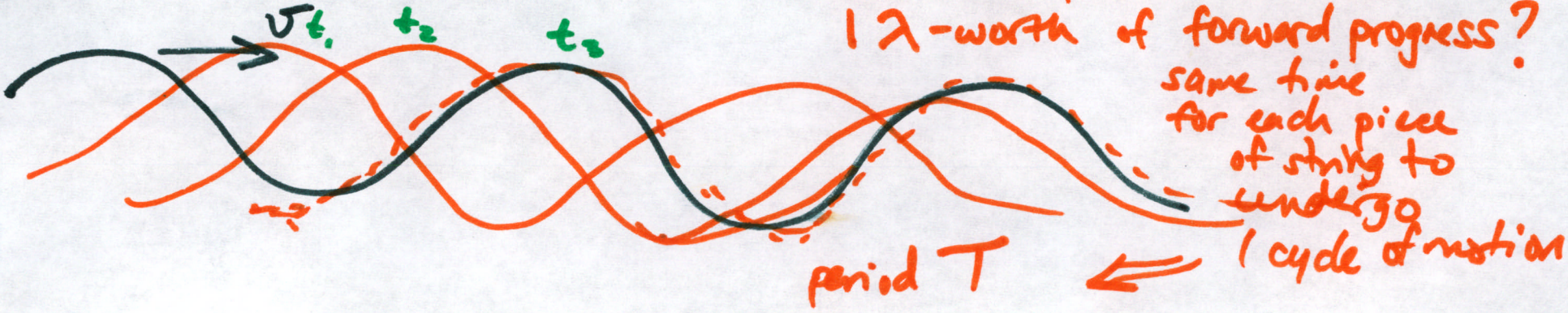
Let's talk about that pattern and its features

snapshot in time



wavelength (spatial extent of ~~the~~ one cycle of the pattern)

Turn time on



How much time does it for pattern to make 1 λ-worth of forward progress?

same time for each piece of string to undergo 1 cycle of motion

period T

T (period) $\Longrightarrow$ can also talk about...

# of secs it takes to undergo 1 cycle

frequency $f = \frac{1}{T}$

unit: $1\,Hz = 1\ cycle/sec$

# of cycles you do in 1 sec

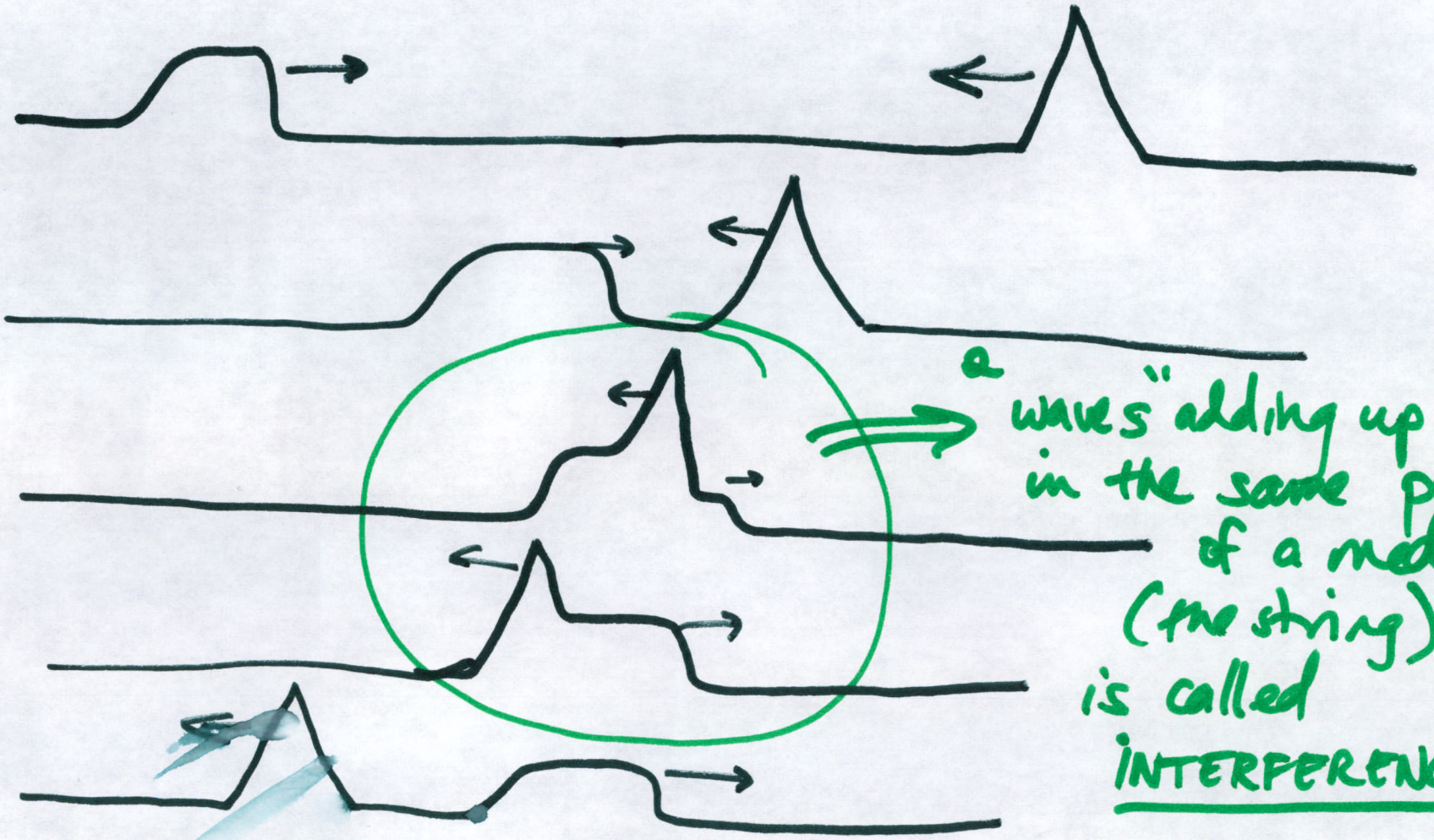
---

wave speed $\boxed{v = \lambda \cdot f}$

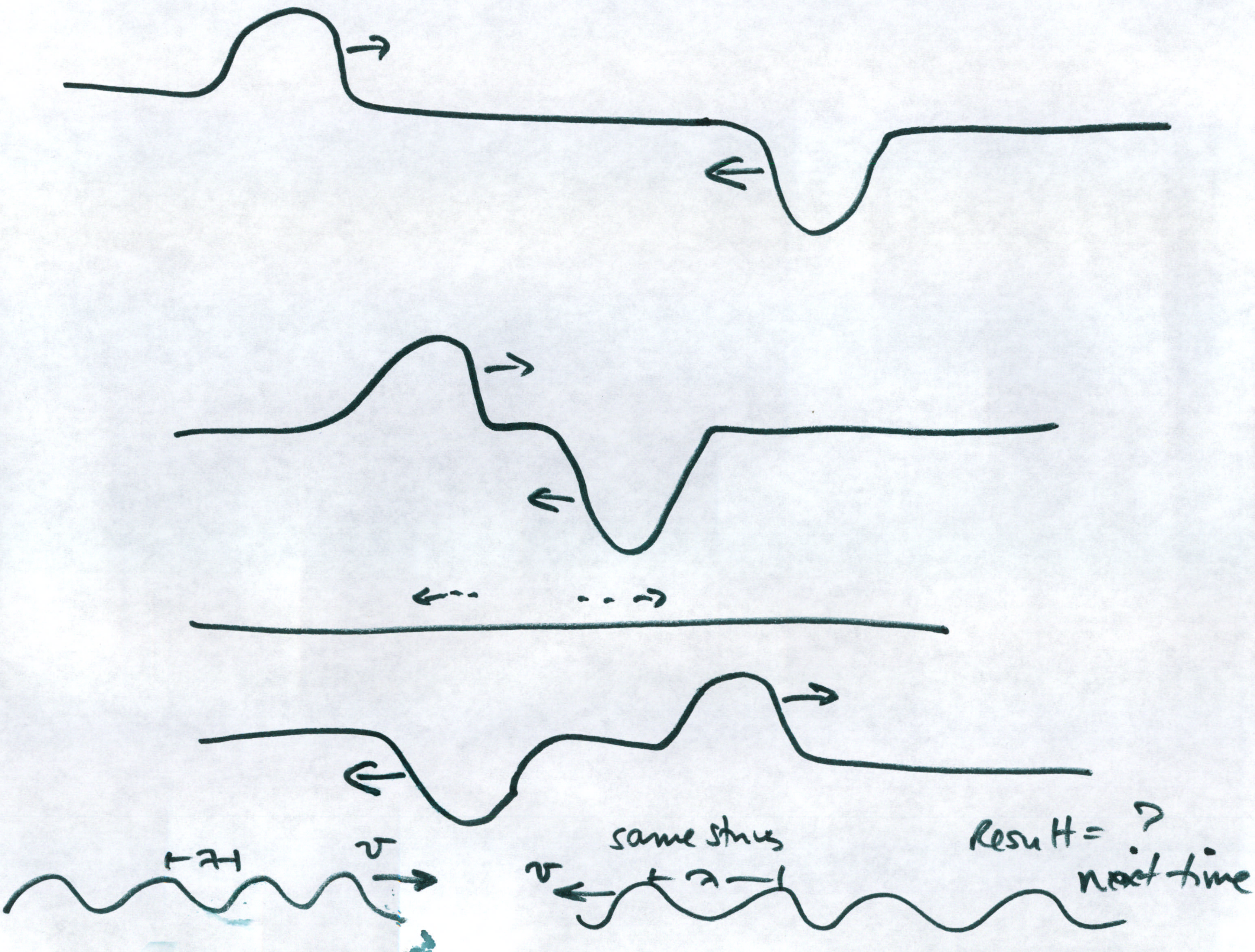
$v = \frac{\lambda}{T}$

$= \frac{\lambda}{1} \cdot \frac{1}{T} = \lambda f$

Multiple waves can be on the same string at the same time... and they don't ~~the~~ inhibit each other's forward progress



a waves "adding up" in the same piece of a medium (the string) is called INTERFERENCE


λ
v
same string
v
λ
Result = ?
next time