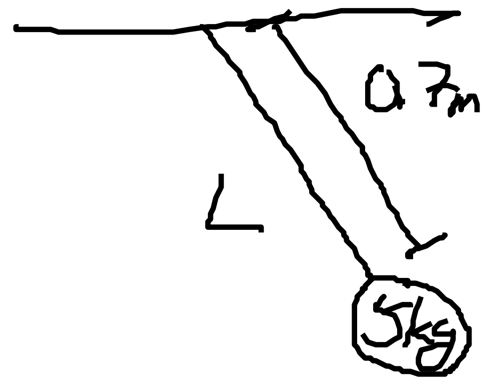
1) "~~v~~ $= 5\,kg$" ← mass



$m = 5\,kg$

$L = 0.7\,m$

"$\lambda = 0.7\,m$"

$$T = 2\pi\sqrt{\frac{L}{g}}$$

← ~~5kg~~

block on spring

$$T = 2\pi\sqrt{\frac{k}{m}}$$

2)

$m = 0.85\,kg$

$A = 0.42\,m$

$f = 3.5\,Hz$

force of spring

$F = ky$ (Don't use this for 2a)

✗ ↙ ↘ ✗

$F = mg$ $\quad$ $f = kA$

"$1/(2\pi)$" $\not\Leftrightarrow$ "$\frac{1}{2}\pi$"

$$\frac{1}{2\pi}$$

"$1 \div 2 \times \pi$" → $\frac{1}{2}\pi$

"$1 \div (2 \times \pi)$" → $\frac{1}{2\pi}$

2b) "$v = \frac{F}{m}$" ✗

Solve for $\underline{V_{max}}$ "speed"

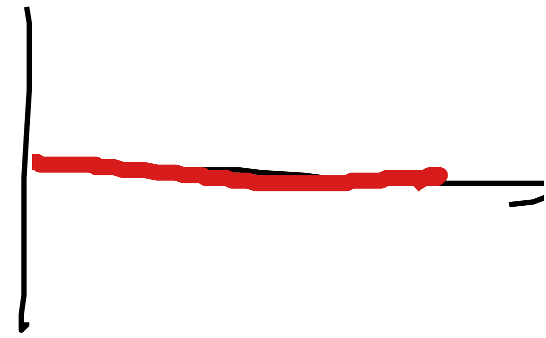
not a_{max} (acceleration)

2c) "$E = mgh$" or "mgA"

$E_s = \frac{1}{2}ky^2$ $E_k = \frac{1}{2}mv^2$

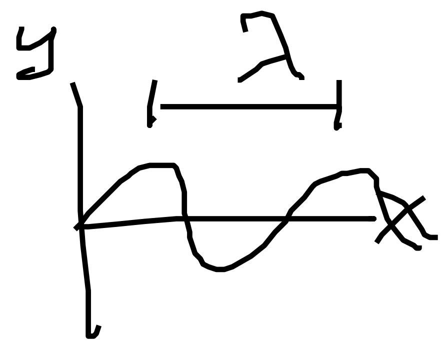
"$\frac{1}{2}mf^2$" confusing f & r.

3a) A = "0"



3b-3c)

Snapshot graph

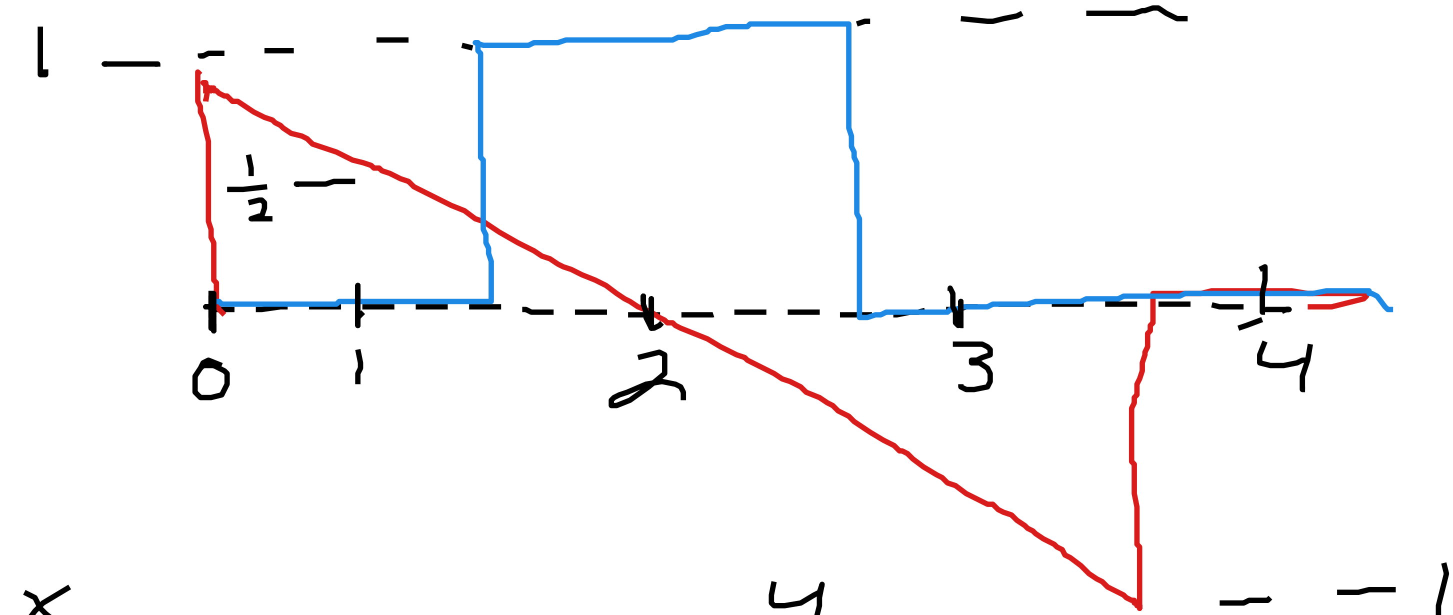


λ or T

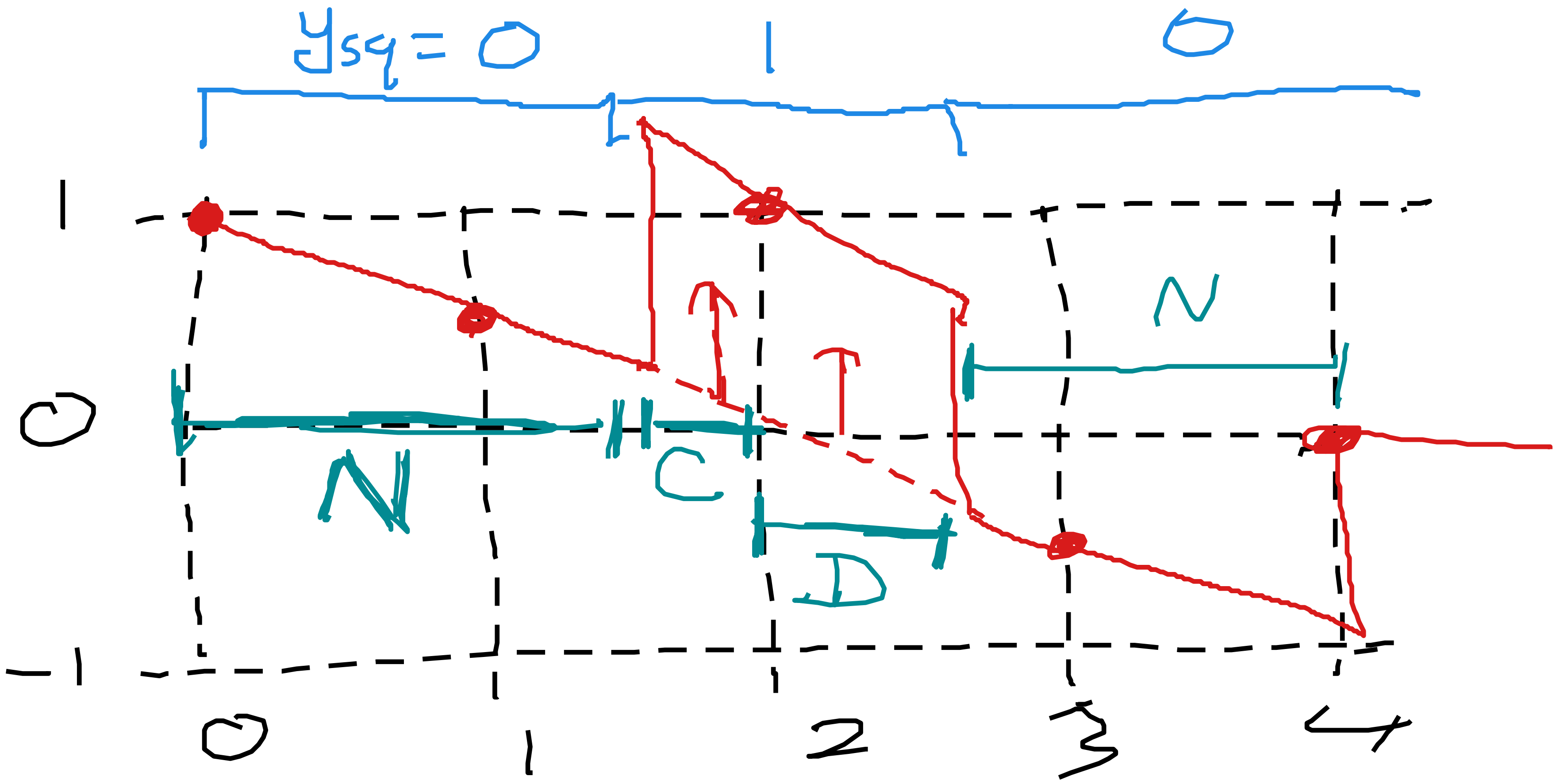
$$v = \lambda f = \frac{\lambda}{t}$$

$$T \times v = \frac{\lambda}{T} \times T \rightarrow \frac{Tv}{v} = \frac{\lambda}{v} = T = \frac{\lambda}{v}$$

$$\frac{v}{1} \times \frac{\lambda}{T} \rightarrow \frac{T}{1} = \frac{\lambda}{v}$$



x	y
0	$1 + 0 = 1$
1	$\frac{1}{2} + 0 = \frac{1}{2}$
2	$0 + 1 = 1$
3	$-\frac{1}{2} + 0 = -\frac{1}{2}$
4	$0 + 0 = 0$



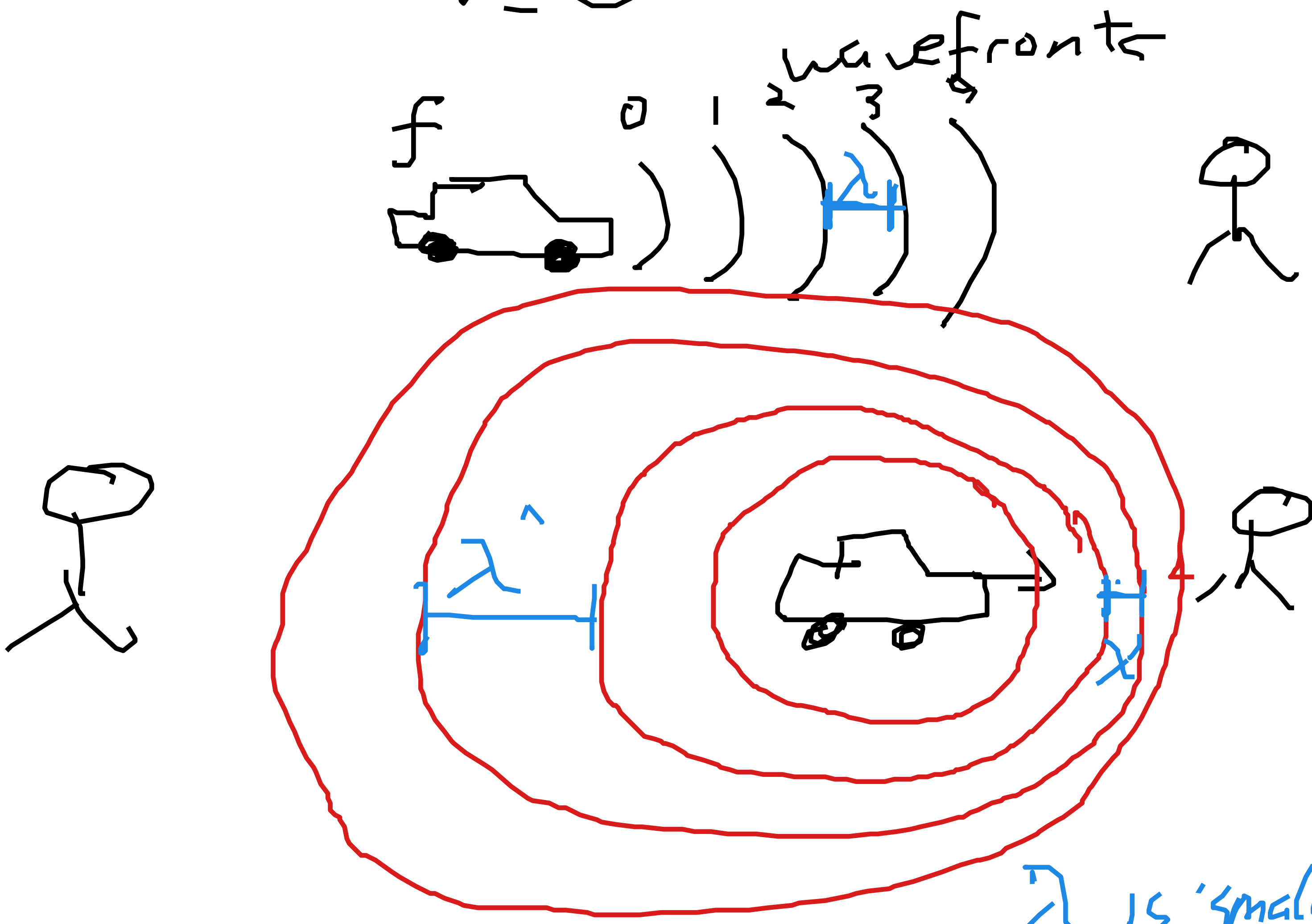
C : on same side

D : on opposite sides

Doppler Effect

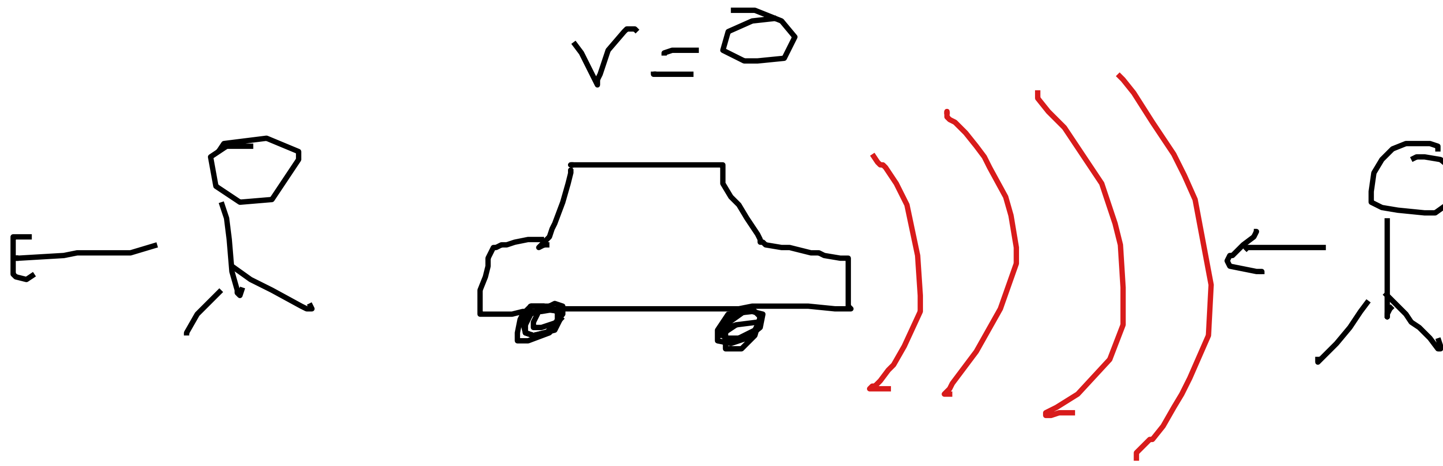
stationary car

$v = 0$



λ is bigger
f is lower
lower pitch

λ is smaller
f is higher
higher pitch



f lower

this person is running through the wavefronts – wavefronts hit them more frequently than if they stood still

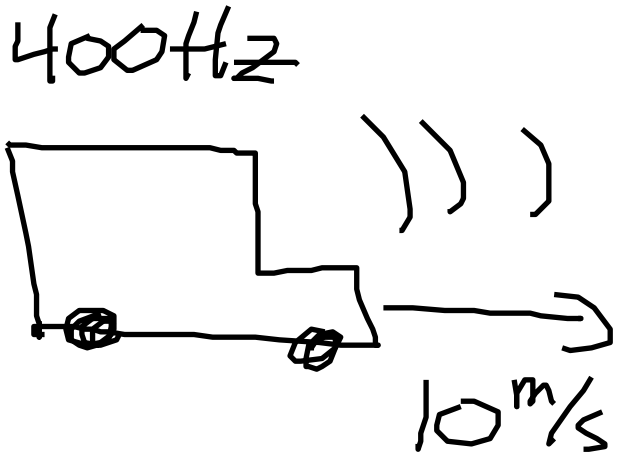
f higher

$$f_{obs} = f_{src} \frac{V_w \mp V_{obs}}{V_w \pm V_{src}}$$

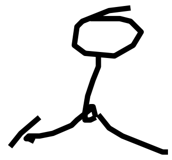
observed frequency — source frequency

≥ 0

- V_w : speed of wave (eg sound 343 m/s in 20°C)
- V_{obs} : speed of observer
- V_{src} : speed of source
- if moving apart : use top sign
- if moving together : use bottom sign



$f_{obs} > 400$



$$f_{obs} = (400\text{Hz}) \frac{343 + 0}{343 - 10}$$

- $V_{obs} = 0$ observer not moving
- $V_{src} = 10\ m/s$
- closer together: use bottom sign

$$f_{obs} = 400 \frac{343}{333} = \boxed{412\text{Hz}} > 400$$