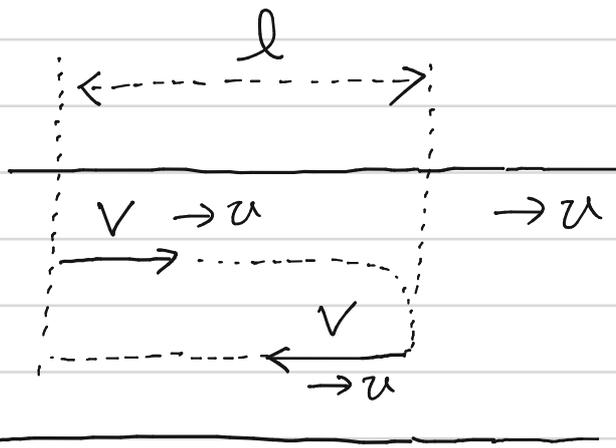


④ (1)



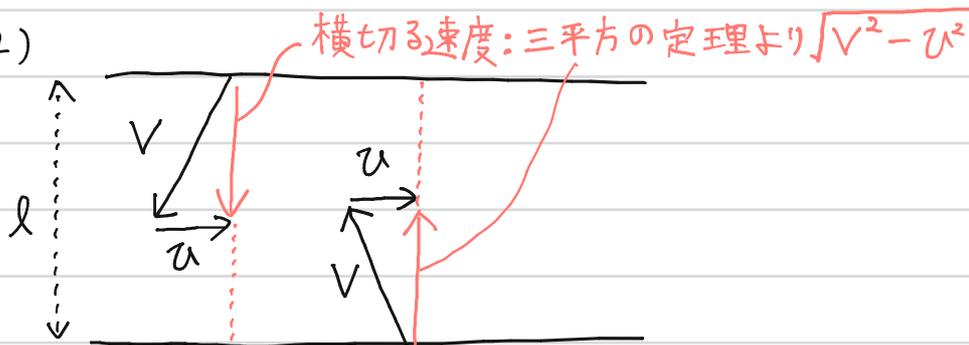
くたぶるときは $V+u$ [m/s] $\Rightarrow t = \frac{l}{V+u}$

のぼるときは $V-u$ [m/s] $\Rightarrow t = \frac{l}{V-u}$

往復で

$$\begin{aligned}
 t_1 &= \frac{l}{V+u} + \frac{l}{V-u} \\
 &= \frac{l(V-u) + l(V+u)}{(V+u)(V-u)} \\
 &= \frac{2lV}{V^2 - u^2} \quad \#
 \end{aligned}$$

(2)



往復で $2l$ のキヨリを $\sqrt{V^2 - u^2}$ で進むので

$$t_2 = \frac{2l}{\sqrt{V^2 - u^2}} = \frac{2l\sqrt{V^2 - u^2}}{V^2 - u^2} \quad \#$$

(3) t_1 と t_2 の分子を比べると

t_1	$2lV$	$\sqrt{V^2 - u^2}$ は V より小さいので
t_2	$2l\sqrt{V^2 - u^2}$	$t_2 < t_1$ #