207.5-2

$\Delta t_0 = \frac{X}{v}$ $\Delta t = \frac{\Delta t_0}{\sqrt{1-(\frac{v}{c})^2}}$, $v = \frac{X}{\Delta t}$

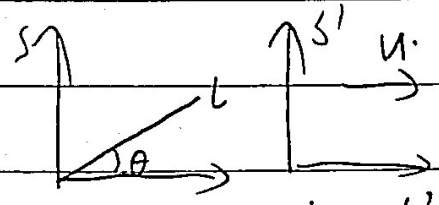
$\Rightarrow \Delta t_0 = \frac{\sqrt{3}}{2}s$

207.5-3

$v = u \& c$. $L = L'\sqrt{1-\frac{v^2}{c^2}}$, $\Delta t = \frac{\Delta t_0}{\sqrt{1-(\frac{v}{c})^2}}$ $\frac{-L'}{\Delta t_0} = c$

$\therefore V = \frac{L}{\Delta t} = 0.6c$ $V = \frac{L+\Delta t u}{\Delta t}$ $V = \frac{L}{\Delta t} - u$ $V = \frac{V'+u}{1+\frac{uV'}{c}} = c$

207.5-4



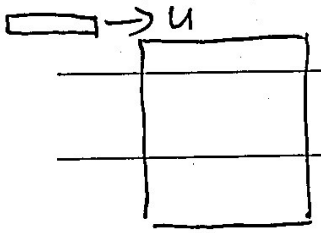
$L_y' = L_y = L\cdot\sin\theta$.

$L_x' = L_x \cdot \sqrt{1-\frac{u^2}{c^2}} = L\cos\theta\sqrt{1-\frac{u^2}{c^2}}$

$\therefore L' = \sqrt{L_y'^2 + L_x'^2} = L\sqrt{1-\cos^2\theta\frac{u^2}{c^2}}\cdot L$

$\theta' = \arctan\frac{L_y'}{L_x'} = \arctan(\tan\theta\cdot\sqrt{\frac{c^2}{c^2-u^2}})$

207.5-5



$L' = a_0 = L_0\sqrt{1-\frac{u^2}{c^2}} \Rightarrow u = c\sqrt{1-\frac{a^2}{L_0^2}}$

207.5-6

(1) $\Delta t = \frac{\Delta t_0}{\sqrt{1-\frac{v^2}{c^2}}} = \frac{5}{3}\Delta t_0 = 4.3\times10^{-8}s$

(2) $L = \Delta t\cdot u = 10.32m$