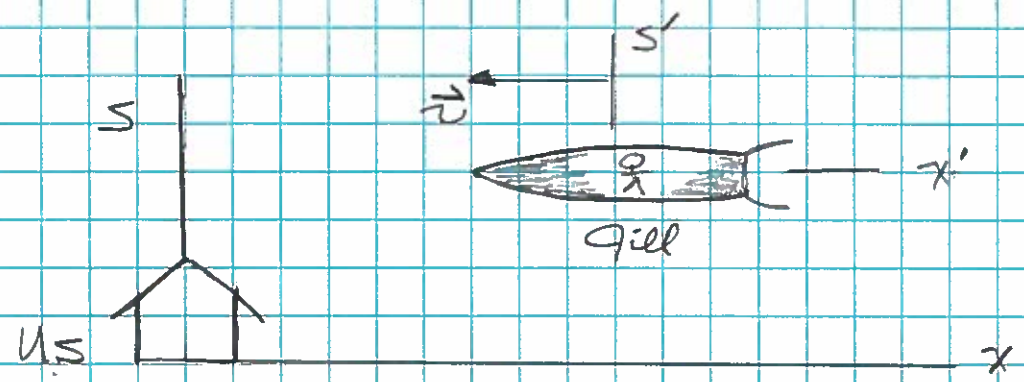

Gill measures the proper length of the ship

$$L_p = 100\,m$$

We, in frame S, measure a contracted length

$$L = 80\,m$$

Now,

$$L = \frac{1}{\gamma} L_p \Rightarrow \gamma = \frac{L_p}{L} = 1.25$$

and

$$\gamma = \frac{1}{\sqrt{1 - v^2/c^2}}$$

$$\gamma^2 (1 - v^2/c^2) = 1$$

So,

$$\frac{v}{c} = \sqrt{1 - \frac{1}{\gamma^2}} = 0.6$$

i.e.

$$\underline{v = 0.6c}$$