

*. (4 points) Without looking anything up, determine what a light year is in meters.

$$1\text{yr} = \left(\frac{1\text{yr}}{1}\right)\left(\frac{365.25\text{days}}{1\text{yr}}\right)\left(\frac{24\text{h}}{1\text{day}}\right)\left(\frac{3600\text{s}}{1\text{h}}\right) = 31,557,600\text{s}$$

$$\begin{aligned}1\text{yr} &= \text{distance light travels in 1yr} = c(1\text{yr}) \\&= (3.00 \times 10^8 \text{m/s})(31,557,600\text{s}) \\&= 9.462 \times 10^{15} \text{m}\end{aligned}$$