

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

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

$$\begin{aligned} 1 \text{ yr} &= \text{distance light travels in 1 yr} = c(1 \text{ yr}) \\ &= (3.00 \times 10^8 \text{ m/s})(31,557,600 \text{ s}) \\ &= 9.46 \times 10^{15} \text{ m} \end{aligned}$$