

Factor-Label Conversions:

$$1 \text{ hour} = 3.6 \times 10^3 \text{ seconds}$$

$$1 \text{ day} = 2.4 \times 10^1 \text{ hours}$$

Ex 1: Seconds to days

$$7.5 \times 10^6 \text{ seconds} = X \text{ days}$$

$$\begin{aligned} & \frac{9.7 \times 10^6 \text{ seconds}}{1} \times \frac{1 \text{ hour}}{3.6 \times 10^3 \text{ seconds}} \times \frac{1 \text{ day}}{2.4 \times 10^1 \text{ hours}} \quad (\text{notice the "cross-cancelling"}) \\ & = \frac{9.7 \times 10^6 \text{ days}}{3.6 \times 2.4 \times 10^3 \times 10^1} = \frac{9.7 \times 10^6 \text{ days}}{8.64 \times 10^4} = \mathbf{1.123 \times 10^2 \text{ days} = 112.3 \text{ days}} \end{aligned}$$

Ex 2: Days to seconds:

How many seconds in 1 year?

$$\begin{aligned} & \frac{1 \text{ yr}}{1} \times \frac{3.65 \times 10^2 \text{ days}}{1 \text{ yr}} \times \frac{2.4 \times 10^1 \text{ hr}}{1 \text{ day}} \times \frac{3.6 \times 10^3 \text{ seconds}}{1 \text{ hr}} \quad (\text{notice the "cross-cancelling"}) \\ & = \frac{3.65 \times 2.4 \times 3.6 \times 10^2 \times 10^1 \times 10^3 \text{ seconds}}{1} \\ & = \mathbf{31.536 \times 10^6 \text{ seconds} = 31,536,000 \text{ seconds}} \end{aligned}$$