

Big 13 Units

That You Need to Memorize

Dimension	SI	English	Conversion Ratios
time	s, hr	s, hr	$3600 \text{ s} = 1 \text{ hr}$
length	m	ft	$1 \text{ m} = 3.2808 \text{ ft}$
mass	kg	lbm, slug	$1 \text{ kg} = 2.2046 \text{ lbm}$ $1 \text{ slug} = 32.174 \text{ lbm}$
force	N	lbf	$1 \text{ N} = 1 \frac{\text{kg} \cdot \text{m}}{\text{s}^2}$ $1 \text{ lbf} = 1 \frac{\text{slug} \cdot \text{ft}}{\text{s}^2}$ $1 \text{ lbf} = 32.174 \frac{\text{lbm} \cdot \text{ft}}{\text{s}^2}$ $1 \text{ lbf} = 4.448 \text{ N}$
temperature*	K, °C	°R, °F	$1 \text{ K} = 1.8 \text{ °R}$ $1 \text{ °C} = 1 \text{ K}$ $1 \text{ °F} = 1 \text{ °R}$

*Be careful to only use these ratios when converting quantities that contain temperature units (e.g. a heat capacity or gas constant) rather than temperatures themselves. When converting actual temperatures, you need to be careful about the difference between absolute (i.e. °R, K) and relative (°F, °C) temperature scales. As such, I recommend that you use

$$T(\text{°F}) = \frac{9}{5} T(\text{°C}) + 32$$

$$T(\text{°R}) = T(\text{°F}) + 459.67$$

$$T(\text{K}) = T(\text{°C}) + 273.15$$

$$T(\text{°R}) = \frac{9}{5} T(\text{K})$$

for converting temperatures.