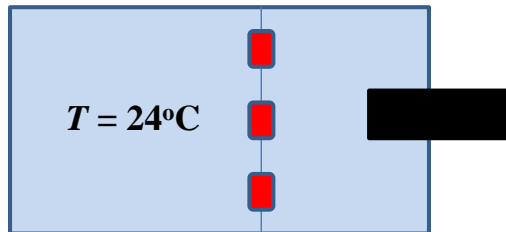


1.52 Water in a swimming pool has a temperature of 24°C . Express this temperature in K, $^{\circ}\text{F}$, and $^{\circ}\text{R}$.

KNOWN: Water is at a specified temperature in $^{\circ}\text{C}$.

FIND: Equivalent temperature in K, $^{\circ}\text{F}$, and $^{\circ}\text{R}$.

SCHEMATIC AND GIVEN DATA:



ANALYSIS:

First convert temperature from $^{\circ}\text{C}$ to K by rearranging Eq. 1.17 to solve for temperature in K

$$T(^{\circ}\text{C}) = T(\text{K}) - 273.15 \quad \rightarrow \quad T(\text{K}) = T(^{\circ}\text{C}) + 273.15$$

$$T_{\text{water}} (\text{K}) = 24^{\circ}\text{C} + 273.15 = \underline{\underline{297.15 \text{ K}}}$$

Next apply Eq. 1.16 to solve for temperature in $^{\circ}\text{R}$

$$T(^{\circ}\text{R}) = 1.8T(\text{K})$$

$$T_{\text{water}} (^{\circ}\text{R}) = (1.8)(297.15 \text{ K}) = \underline{\underline{534.87 ^{\circ}\text{R}}}$$

Finally, apply Eq. 1.18 to solve for temperatures in $^{\circ}\text{F}$

$$T(^{\circ}\text{F}) = T(^{\circ}\text{R}) - 459.67$$

$$T_{\text{water}} (^{\circ}\text{F}) = 534.87 ^{\circ}\text{R} - 459.67 = \underline{\underline{75.2^{\circ}\text{F}}}$$