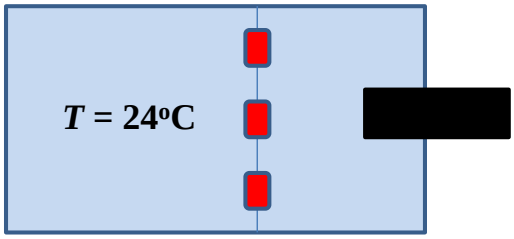
1.43 Water in a swimming pool has a temperature of 24°C. Express this temperature in K, °F, and °R.

KNOWN: Water is at a specified temperature in °C.

FIND: Equivalent temperature in K, °F, and °R.

SCHEMATIC AND GIVEN DATA:



ANALYSIS:
First convert temperature from °C to K by rearranging Eq. 1.17 to solve for temperature in K

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

T_{water} (K) = 24°C + 273.15 = **297.15 K**

Next apply Eq. 1.16 to solve for temperature in °R

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

T_{water} (°R) = (1.8)(297.15 K) = **534.87 °R**

Finally, apply Eq. 1.18 to solve for temperatures in °F

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

T_{water} (°F) = 534.87 °R – 459.67 = **75.2°F**