

**The correct answer is (a):
81°F = 27°C = 300K, as follows.**

- Write relationship of T_C to T_F , using water's freezing temperature, $0^\circ\text{C} = 32^\circ\text{F}$ $\{\rightarrow T_C=0$ when $T_F=32$, so that $T_C = (T_F - 32)^*$ (constant) $\}$
- and **boiling** temperature, $100^\circ\text{C} = 212^\circ\text{F}$, $\{\rightarrow T_C=100$ when $T_F=212$, or $T_C=100$ when $(T_F-32) = 180\}$. These give the relation
- $T_C = 100^*(T_F - 32)/180 = (5/9)^*(T_F - 32) = T_C$.

Then we insert $T_F = 81$ to compute $T_C = (81 - 32)^*(5/9) = 27.2^\circ\text{C}$.

- And $T_A = (T_C + 273) = 300\text{ K}$, since T_A is always given by $T_A = T_C + 273$.