Temperature Conversion Practice Quiz Key

The information at the beginning of the quiz is included so that all questions can be answered with only an understanding of the Fahrenheit, Celsius, and Kelvin scales.

1. $[\mathrm{K}] = [°\mathrm{C}] + 273$
   $[K] - 273 = [°C]$
   $(100.K) - 273 = [°C] = \mathbf{-173°C}$

2. $[°C] = ([°F] - 32) \cdot \frac{5}{9}$
   $[°C] = ((0.0°F) - 32) \cdot \frac{5}{9} = (-32) \cdot \frac{5}{9} = \mathbf{-18°C}$

3. $Absolute\ zero = 0\ K = 0°Ra$
   $[K] = [°C] + 273$
   $[K] - 273 = [°C]$
   $(0\ K) - 273 = -273°C$
   $\left(-273°C \cdot \frac{9}{5}\right) + 32 = -459°F$
   $Absolute\ zero = 0°Ra = -459°F$
   $[°Ra] = [°F] + 459$
   $[°Ra] = (0.00) + 459 = \mathbf{459°Ra}$

4. To find the scale multiple, we must consider that the interval of temperature between the boiling and freezing of water is $(100°C - 0°C) = 100°C$ and $(60°R\text{ø} - 7.5°R\text{ø}) = 52.5°R\text{ø}$. Since $0°C = 7.5°R\text{ø}$, we know that after the scale multiple is applied, there will be a 7.5° shift added.
   Therefore, $\left(10.0°C \cdot \frac{52.5°R\text{ø}}{100°C}\right) + 7.5 = \mathbf{12.8°R\text{ø}}$

5. To find the scale multiple, we must consider that the interval of temperature between the boiling and freezing of water is $(212°F - 32°F) = 180°F$ and $(80°R\text{é} - 0°R\text{é}) = 80°R\text{é}$. Since $32°F = 0°R\text{é}$, we know that before the scale multiple is applied, there will be a 32° shift subtracted.
   Therefore, $(98.6°F - 32) \cdot \frac{80°R\text{é}}{180°F} = \mathbf{29.6°R\text{é}}$

6. To find the scale multiple, we must consider that the interval of temperature between the boiling and freezing of water is $(212°F - 32°F) = 180°F$ and $(0°D - 150°D) = 150°D$ (for the moment being, ignore the negative).
   Since $212°F = 0°D$, we know that there will be a 212° shift. To account for the negative, the temperature in Fahrenheit will be subtracted from 212.
   Therefore, $(212 - 451°F) \cdot \frac{150°D}{180°F} = \mathbf{-199°D}$