Problem 11

For about 10 years after the French Revolution, the French government attempted to base measures of time on multiples of ten: One week consisted of 10 days, one day consisted of 10 hours, one hour consisted of 100 minutes, and one minute consisted of 100 seconds. What are the ratios of (a) the French decimal week to the standard week and (b) the French decimal second to the standard second?

Solution

Part (a)

One French week is defined to be 10 days, and one standard week is defined to be 7 days.

$$\frac{1 \text{ French week}}{1 \text{ standard week}} = \frac{10 \text{ days}}{7 \text{ days}} \approx 1.43$$

Part (b)

In order to compare the seconds, the time for a certain event (sunrise) needs to be measured in the two systems.

$$\frac{\text{Fraction of a second in one French day}}{\text{Fraction of a second in one standard day}} = \frac{\left(\frac{1 \text{ French day}}{10 \cancel{\text{hours}} \times \frac{100 \cancel{\text{ min}}}{1 \cancel{\text{ hours}}} \times \frac{100 \text{ sec}}{1 \cancel{\text{ min}}}}\right)}{\left(\frac{1 \text{ standard day}}{24 \cancel{\text{ hours}} \times \frac{60 \cancel{\text{ min}}}{1 \cancel{\text{ hours}}} \times \frac{60 \text{ sec}}{1 \cancel{\text{ min}}}}\right)} = \frac{24 \times 60 \times 60}{10 \times 100 \times 100} = 0.864$$