

Problem 14

A lecture period (50 min) is close to 1 microcentury. (a) How long is a microcentury in minutes?
(b) Using

$$\text{percentage difference} = \left(\frac{\text{actual} - \text{approximation}}{\text{actual}} \right) 100,$$

find the percentage difference from the approximation.

Solution

Convert 1 microcentury to minutes using conversion factors.

$$\begin{aligned} 1 \text{ microcentury} &= 1 \cancel{\text{microcentury}} \times \frac{1 \cancel{\text{century}}}{10^6 \cancel{\text{microcenturies}}} \times \frac{100 \cancel{\text{years}}}{1 \cancel{\text{century}}} \times \frac{365 \cancel{\text{days}}}{1 \cancel{\text{year}}} \times \frac{24 \cancel{\text{hours}}}{1 \cancel{\text{day}}} \times \frac{60 \text{ min}}{1 \text{ hour}} \\ &= 52.56 \text{ min} \end{aligned}$$

Plug in 52.56 min for the actual value, and plug in 50 min for the approximation value.

$$\text{percentage difference} = \left(\frac{\text{actual} - \text{approximation}}{\text{actual}} \right) 100 = \frac{52.56 - 50}{52.56} \times 100 = 4.87\%$$