Exercise 179

An alternating current for outlets in a home has voltage given by the function $V(t) = 150\cos 368t$, where V is the voltage in volts at time t in seconds.

a. Find the period of the function and interpret its meaning.

b. Determine the number of periods that occur when 1 sec has passed.

Solution

Part (a)

The period is

$$T = \frac{2\pi}{368} = \frac{\pi}{184} \text{ sec} \approx 0.0171 \text{ sec}$$

and represents the time it takes for one full wave of voltage to pass.

Part (b)

Divide 1 second by the period.

$$\#\text{ of Periods in 1 Second} \approx \frac{1 \text{ sec}}{\frac{\pi}{184} \text{ sec}} = \frac{184}{\pi} \approx 58.6$$