The function $f(x)=10\cos(314x-0.628)+5$, shown graphically below, is periodic.

$$\omega = \frac{2\pi}{T} = 314$$

$$\Rightarrow \quad T = 0.02$$
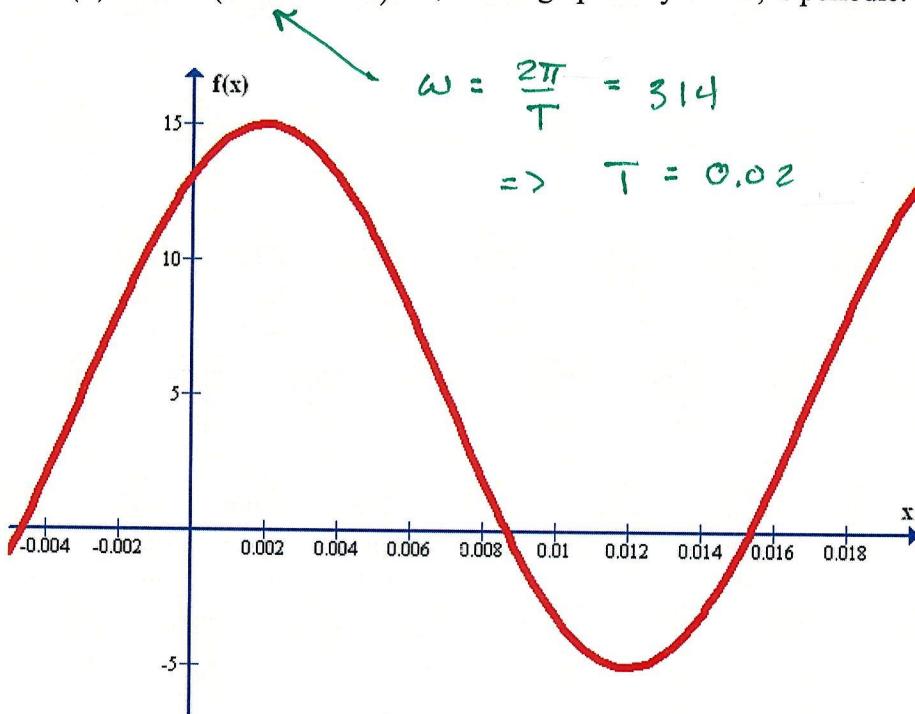
a. Determine the average value of $f(x)$.

$$F_{ave} = \frac{1}{0.02}\int_0^{0.02} f(x)\,dx = \frac{1}{0.02}\left[\int_0^{0.02} 10\cos(314x-0.628)\,dx + \int_0^{0.02} 5\,dx\right]$$

$$= \frac{1}{0.02}\left[0 + 5(0.02)\right] = 5$$

b. Determine the *rms* (or *effective*) value of $f(x)$.

$$F_{rms}^2 = \frac{1}{0.02}\left[\int_0^{0.02} 100\cos^2(314x-0.628)\,dx\right.$$

$$+ \int_0^{0.02} 100\cos(314x-0.628)\,dx$$

$$\left. + \int_0^{0.02} 25\,dx\right]$$

$$= \frac{100}{2} + 25 = 75$$

$$\therefore \quad F_{rms} = \sqrt{75} = 5\sqrt{3} \quad \text{or} \quad 8.66$$