1. Example 6.6. Find the Nyquist rate and Nyquist interval for the continuous-time signal given below :

$$x(t) = \frac{1}{2\pi}\cos(4000\pi t)\cos(1000\pi t)$$

2. **Example 6.9. Find the Nyquist rate for the continuous-time signal given below**

$$x(t) = \frac{\sin(4 \times 10^3 \pi t)}{\pi t}$$

3. **Example 6.11. Given a continuous-time signal $x(t)$ with Nyquist rate ω_0. Determine the Nyquist rate for the continuous-time signal.**

$$y(t) = x(t)\cos\omega_0 t$$

Solution: If the continuous-time signal [illegible] then its

4. **Determine the Nyquist sampling rate and Nyquist sampling interval for the following signals.** Note that the sampling interval T_s is the inverse of the sampling rate f_s: $T_s = \frac{1}{f_s}$

(a) $\text{sinc}^2(100\pi t)$; (b) $0.01\ \text{sinc}^2(100\pi t)$;

(c) $\text{sinc}(100\pi t) + \text{sinc}^2(60\pi t)$; (d) $\text{sinc}(100\pi t)\text{sinc}(50\pi t)$

5. **The Nyquist sampling rate for the signal** $x(t) = \frac{\sin(500\pi t)}{\pi t} \times \frac{\sin(700\pi t)}{\pi t}$ **is**

6. Determine the Nyquist rate of the following signals:

(a) 10cos(40t)

(b) 10cos(40t)+10sin(40t)

(c) 20sin(40t)sin(60t)

(d) 40sinc(20t)