Suppose now that a signal $y(t) = (c_0 + c_1 x(t)) \cos(2\pi f_c t + \theta)$ is received, but θ is unknown to the receiver.

- Can the signal $x(t)$ be recovered from $y(t)$ using only LTI filtering?

Solution

- No, to recover (or demodulate) $x(t)$ new frequencies must be introduced, which cannot occur with LTI systems. The system must be either nonlinear or time varying.