

Exercise Lesson 1

Problems from the compendium:

2.1, 2.2, 2.3, 2.4, 2.5, 2.6, 2.7, 2.8

Other problems:

1.1 Binary transmission:

Consider $g(t) = g_{tri}(t)$ given in Fig. D.5 in the Appendix (triangular pulse).

(a) Draw the transmitted signal

$$s(t) = b[0]g(t) + b[1]g(t - T_b) + b[2]g(t - 2T_b) + b[3]g(t - 3T_b)$$

where $\mathbf{b} = b[0]b[1]b[2]b[3] = 10110$ and $T = T_b$.

(b) Repeat part (a) for $T = T_b/2$.

1.2 Shifting and scaling:

For the signal $g(t) = g_{tri}(t)$ from Problem 1.1,

(a) Draw the signal $g(t - 2T)$.

(b) Draw the signal $g((t - T)/2)$.

(c) Draw the signal $g(tT - T/2)$.

1.3 Reflection:

Consider now the signal $x(t) = g_{tri}(t/2) \cdot g_{rec}(t)$.

(a) Draw the signal $x(t)$.

(b) Draw the signal $x(-t)$.

(c) Draw the signal $x(-t - T)$.

1.4 Sinusoidal signals:

(a) Draw the signal $s(t) = \sin(t)$ in the interval $0 \leq t \leq 2\pi$.

(b) Draw the signal $s(t) = \sin(2\pi/T t)$ in the interval $0 \leq t \leq 2T$.

(c) Draw the signal $s(t) = \sin(2\pi/T t + \pi/2)$ in the interval $0 \leq t \leq 2T$.