

1- What is

- Laplace transformation
- Z transformation
- Fourier transformation
- Fourier series

2- Determine the Laplace transform functions for the following time function

- $f(t) = 3t + 5 + \sin(t)$
- $f(t) = 14t^3 - e^{-t}$
- $f(t) = 3e^{-6t} \cdot \cos(2t)$
- $f(t) = 5\sin 3t$
- $f(t) = 7e^{-3t} \cdot \sin(3t)$

3- Determine the time functions for the given TFs directly from the LT table or using partial fraction.

- $F(s) = \frac{6}{s} + \frac{4}{s^2+4} + \frac{8}{s+4}$
- $F(s) = \frac{7}{(s+1)(s+3)}$
- $F(s) = \frac{1}{s^2+6s+5}$
- $F(s) = \frac{s+3}{s(s+2)(s+4)}$
- $F(s) = \frac{18}{s^2+81}$

4- Determine the z transform functions for the following time function , consider $T = 1$

- $f(t) = 4t + 7 + \sin(t)$
- $f(t) = 3 \cos(4t) + 2e^{-3t}$
- $f(t) = 3e^{-6t} \cdot \cos(2t)$

5- Determine the z transform functions for the following Laplace function

- $F(s) = \frac{s+1}{s(s^2+6s+8)}$
- $F(s) = \frac{2(s+4)}{s(s+1)(s+2)}$

6- Determine the Fourier transformation representation for the signal given

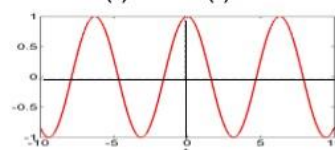
- $x(t) = 4e^{6t} u(t) + 2e^{-5t} \cos(6t) u(t)$
- $x(t) = 3e^{-2t} u(t) + 2e^{-5t} \sin(6t) u(t)$
- $x(t) = f(t-6) + f(t+9)$
- $x(t) = 4e^{4t} - 3te^{-5t} u(t)$

7- Determine the Fourier series for the signal given

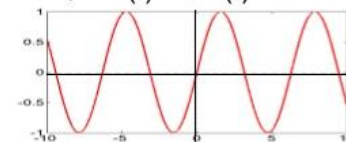
- $x(t) = \sum_{n=0}^5 a_n \cdot e^{jn5\pi t}$ when $a_0 = 1, a_1 = 2, a_2 = 4, a_3 = 8, a_4 = 10$ and $a_5 = 12$
- $x(t) = \sum_{n=-4}^4 a_n \cdot e^{jn5\pi t}$ when $a_0 = 1, a_1 = 2, a_2 = 4, a_3 = 8, a_4 = 10$
- $x(t) = a_0 + 3 \sum_{n=5}^5 a_n \cdot \cos(3\pi n t)$ when $a_0 = 1, a_1 = 2, a_2 = 4, a_3 = 8, a_4 = 10$ and $a_5 = 12$
- $x(t) = 4 \sum_{n=1}^4 b_n \cdot \sin(4\pi n t)$ when $b_1 = 2, b_2 = 4, b_3 = 8, b_4 = 10$

8- Determine the Fourier series for the signal given

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



$$x(t) = \sin(t)$$



- From $\cos(t)$ Determine the b_n
- From $\sin(t)$ Determine the a_0 and a_n