

1994 Paper 8 Question 5

Information Theory and Coding

Define the Fourier Series of the periodic function $f(x)$ with period 2π , giving formulae for the Fourier Coefficients. [5 marks]

Derive the Fourier Coefficients for the Sawtooth function, the periodic function defined by

$$f(x) = x, -\pi < x < \pi \quad [10 \text{ marks}]$$

The video drive circuitry of a computer monitor attempts to generate a periodic Sawtooth waveform to generate horizontal scanlines. However, the output circuitry is bandlimited to W ; what would be the effect of this on the displayed pixels for various values of W ? [5 marks]