



UNIT 4 Fourier Transforms  
Statement of Fourier Integral Theorem

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### Fourier Transform

Fourier Transform Pair:

The Fourier transform of  $f(x)$  is given by

$$F(s) = \frac{1}{\sqrt{2\pi}} \int_{-\infty}^{\infty} f(x) e^{isx} dx \rightarrow \textcircled{1}$$

Complex Fourier transform  
of  $f(x)$

Then the function  $f(x)$  is the Inverse Fourier transform

of  $F(s)$  is given by,

$$f(x) = \frac{1}{\sqrt{2\pi}} \int_{-\infty}^{\infty} F(s) e^{-isx} ds \rightarrow \textcircled{2}$$

The above eqns  $\textcircled{1}$  and  $\textcircled{2}$  are jointly called Fourier

Transform pair,

$$f(x) = F^{-1}[F(s)] = F^{-1}[F[f(x)]]$$