PRACTICE TEST :II FOURIER TRANSFORM

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2 points

Given that $\int_0^\infty \frac{\sin t}{t} dt = \frac{\pi}{2}$ *then* Fourier sine transform $F_s(\lambda)$, $f(x)=\frac{1}{x}$, $x > 0$, *is* given by

a) π b) π c) $\frac{\pi}{4}$ d) $\frac{\pi}{2}$

- a
- b
- c
- d

New Roll Number

Your answer

2 points

If the Fourier integral representation of $f(x)$ is

$\frac{1}{\pi}\int_0^\infty \frac{\cos\lambda x + \cos[\lambda(\pi - x)]}{1-\lambda^2} d\lambda = \begin{cases} \sin x, & 0 < x < \pi \\ 0, & x < 0 \, and \, x > \pi \end{cases}$ then value of the integral $\int_0^\infty \frac{\cos\frac{\lambda\pi}{2}}{1-\lambda^2} d\lambda$ is

a) $\frac{\pi}{4}$ b) 1 c) 0 d) $\frac{\pi}{2}$

- a
- b
- c
- d

Division *

Your answer

Untitled Question

2 points

.Find the Fourier Transform $F(\lambda)$ of $f(x) = \begin{cases} 1, & |x| < a \\ 0, & |x| > a \end{cases}$ is

a) $\frac{2\sin\lambda a}{\lambda}$ b) $\frac{e^{-i\lambda a}}{\lambda}$ c) $\frac{e^{i\lambda a}}{\lambda}$ d) $\frac{2\cos\lambda a}{\lambda}$

- a
- b
- c
- d

2 points

The Fourier cosine transform $F_c(\lambda)$ of f(x)= $e^{-|x|}$ $-\infty < x < \infty$ is

a) $\frac{\lambda}{1+\lambda^2}$ b) $\frac{1}{1+\lambda^2}$ c) $\frac{1}{1-\lambda^2}$ d) $\frac{-1}{1+\lambda^2}$

- a
- b
- c
- d

2 points

The Fourier Transform $F(\lambda)$ of f(x)= $\begin{cases} x^2, x > 0 \\ 0, x < 0 \end{cases}$ is

a) $-\frac{2i}{\lambda^3}$ b) $\frac{1}{i\lambda^3}$ c) $\frac{2i}{\lambda^3}$ d) $-\frac{1}{i\lambda^3}$

- a
- b
- c
- d

Name of the student *

Your answer

2 points

Given that $F_s(\lambda) = \int_0^\infty u^{m-1} \sin\lambda u du = \frac{\Gamma(m)}{\lambda^m} \sin\frac{\pi m}{2}$ is, ,

Then the Fourier sine transform $F_s(\lambda)$ of $f(x) = x^2$ $x > 0$ is given by

a) $-\frac{2}{\lambda^3}$ b) $\frac{2}{\lambda^3}$ c) $\frac{3}{\lambda^2}$ d) $-\frac{3}{\lambda^2}$

- a
- b
- c
- d

2 points

The Fourier Transform $F(\lambda)$ of f(x)= $e^{-|x|}$ is Given by

a) $\frac{1}{1+\lambda^2}$ b) $\frac{1}{1-\lambda^2}$ c) $\frac{2}{1-\lambda^2}$ d) $\frac{2}{1+\lambda^2}$

- a
- b
- c
- d

2 points

.In the Fourier integral representation of

$$\frac{1}{2\pi}\int_{-\infty}^{\infty}\left(\frac{e^{-i\lambda\pi}+1}{1-\lambda^2}\right)e^{i\lambda x}\,d\lambda=\begin{cases} sinx, 0 < x < \pi \\ 0, x < 0 and x > \pi \end{cases}, F(\lambda)\text{is}$$

) $\frac{1+\lambda^2}{1-i\lambda}$ b) $\frac{e^{-i\lambda}}{1-\lambda^2}$ c) $\frac{e^{-i\lambda\pi}+1}{1-\lambda^2}$ d) $\frac{\sin\lambda}{1-\lambda^2}$

- a
- b
- c
- d

2 points

. The Fourier cosine transform $\frac{4}{\pi}\int_0^\infty \frac{1-cosu}{u^2} cos\lambda u du = \begin{cases}(1-\lambda), & 0<\lambda<1 \\ 0, & \lambda>1\end{cases}$ is,

then the value of the integral $\int_0^\infty \frac{sin^2 z}{z^2}$ is

a) 1 b) $\frac{\pi}{2}$ c) 0 d) $\frac{\pi}{4}$

- a
- b
- c
- d

2 points

)For the Fourier sine integral representation

$$\frac{6}{\pi}\int_0^\infty \frac{\lambda sin\lambda x}{(1+\lambda^2)(1+\lambda^4)} d\lambda = e^{-x} - e^{-2x}, x > 0, F_s(\lambda) \text{is,}$$

a) $\frac{(\lambda^2+1)(\lambda^2+4)}{3\lambda}$ b) $\frac{\lambda}{(1+\lambda^2)(1+\lambda^4)}$ c) $\frac{3\lambda}{(1+\lambda^2)(1+\lambda^4)}$ d) $\frac{\lambda sin\lambda x}{(1+\lambda^2)(1+\lambda^4)}$

- a
- b
- c
- d

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