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Courses »

## Unit 10 - Week 9: Integral Transforms

### Assignment 9

1) The Fourier transform of the function  $e^{-2|x|}$  is equal to

1 point

$$\frac{1}{\sqrt{2\pi}} \delta(k - 2)$$

$$\frac{1}{\sqrt{2\pi}} (\delta(k + 2) + \delta(k - 2))$$

$$\frac{1}{\sqrt{2\pi}} \frac{4}{4+k^2}$$

None of the above

**Accepted Answers:**

$$\frac{1}{\sqrt{2\pi}} \frac{4}{4+k^2}$$

2) The Fourier transform of the function  $e^{-x^2/2}$  is

1 point

$$e^{k^2/4}$$

$$e^{-k^2/2}$$

$$\frac{1}{\sqrt{2\pi}} e^{-k^2/8}$$

None of the above

**Accepted Answers:**

$$e^{-k^2/2}$$

3) The inverse Fourier transform of the function  $\tilde{f}(k) = 1$  is

1 point

$$\sqrt{2\pi} \delta(x)$$

$$\frac{1}{\sqrt{2\pi}} x$$

$$\frac{1}{\sqrt{2\pi}}$$

**Accepted Answers:**

$$\sqrt{2\pi}\delta(x)$$

4) The Fourier transform of  $e^{j2\pi x}$  is

1 point

$$\frac{1}{\sqrt{2\pi}} e^{kj/2}$$

$$\frac{1}{\sqrt{2\pi}} e^{2\pi k}$$

$$\frac{1}{\sqrt{2\pi}} e^{kj/2\pi}$$

$$\sqrt{2\pi}\delta(k - 2\pi)$$

**Accepted Answers:**

$$\sqrt{2\pi}\delta(k - 2\pi)$$

5) The Fourier transform of  $xe^{-x^2/2}$  is

1 point

$$ike^{-k^2/4}$$

$$e^{-(k+1)^2/2}$$

$$-ike^{-k^2/2}$$

None of the above

**Accepted Answers:**

$$-ike^{-k^2/2}$$

6) The inverse Fourier transform of the function  $e^{2ik}e^{-k^2/2}$  is equal to

1 point

$$e^{(x-2)^2/2}$$

$$\delta(x - 2)e^{-x^2/2}$$

$$\delta(x + 2)e^{-x^2/2}$$

None of the above

**Accepted Answers:**

$$e^{(x-2)^2/2}$$

7) The solution of the Differential equation

1 point

$$\frac{\partial c}{\partial t} = \partial^2 c$$

with initial condition  $c(x,0) = \delta(x-1)$  is equal to

None of the above

$$\frac{1}{\sqrt{\pi}} e^{-x^2/4t}$$

$$\frac{1}{\sqrt{\pi t}} e^{-x^2/2t}$$

$$e^{(x-1)^2/2t}$$

None of the above

**Accepted Answers:**

*None of the above*

8) The Laplace Transform of  $2 + 4t^2$  is equal to

**1 point**

$$\frac{2}{s} + \frac{4}{s^3}$$

$$\frac{1}{s} + \frac{4}{s^3}$$

$$\frac{2}{s} + \frac{24}{s^3}$$

None of the above

**Accepted Answers:**

*None of the above*

9) The Laplace Transform of  $te^{-3t}$  is

**1 point**

$$1/(s - 3)^2$$

$$\frac{3}{s^2}$$

$$1/(s + 3)^2$$

None of the above

**Accepted Answers:**

$1/(s + 3)^2$

