Lecture 1 Activity Results for Test Student

Score for this attempt: 1 out of 1

Submitted Jan 9 at 3:10pm
This attempt took 4 minutes.

Question 1

1 / 1 pts

Find a general solution of u''(x) = 3u(x).

$$\bigcirc \ u(x) = c \, e^{\sqrt{3}x}$$

$$\bigcirc \ u(x) = c\,e^{-\sqrt{3}x}$$

Correct!

$$\bigcirc \ u(x) = c_1 e^{3x} + c_2 e^{-3x}$$

$$\bigcirc \ u(x) = c_1 \cos(\sqrt{3}x) + c_2 \sin(\sqrt{3}x)$$

Additional Comments:

Question 2

0 / 0 pts

Find a general solution of u''(x) - 6u'(x) + 9u(x) = 0.

$$\bigcirc \ u(x) = c \, e^{3x}$$

$$u(x) = c_1 e^{3x} + c_2 e^{-3x}$$

$$u(x) = c x e^{3x}$$

Correct!

$$u(x) = c_1 e^{-3x} + c_2 x e^{-3x}$$



Question 3

0 / 0 pts

Let $u_p(t)$ be a particular solution of $u''(t)-3u(t)=\cos(t^2)$. Find a general solution of $u''(t)-3u(t)=\cos(t^2)$.

$$\bigcirc \ u(t) = c_1 u_p(t) + c_2 e^{\sqrt{3}t}$$

$$\bigcirc \ u(t) = c_1 u_p(t) + c_2 e^{-\sqrt{3}t}$$

Correct!

$$\bigcirc \ u(t)=u_p(t)+c_1e^{\sqrt{3}t}+c_2te^{\sqrt{3}t}$$

$$\bigcirc \ u(t) = u_p(t) + c_1 \cos(\sqrt{3}t) + c_2 \sin(\sqrt{3}t)$$



Question 4

0 / 0 pts

Consider the PDE $\cos(t)u_t + e^x u_x = x^2 \sin(t)$ for u(x,t). We classify it as

- a first order, nonlinear, inhomogeneous PDE.
- a first order, linear, homogeneous PDE.

Correct!

- a first order, linear, inhomogeneous PDE.
- a first order, nonlinear, homogeneous PDE.
- a second order, linear, inhomogeneous PDE.

Question 5

0 / 0 pts

Consider the eigenvalue problem $\left\{egin{aligned} X''(x) = -\lambda X(x) \ X(0) = 0, & X(L) = 0 \end{aligned}
ight.$

The eigenvalues and eigenfunctions are

$$\bigcirc \; \lambda_n = (n\pi)^2, \quad X_n(x) = \sin(n\pi x), \quad n=1,2,\ldots$$

Correct!

$$igotimes \lambda_n = (rac{n\pi}{L})^2, \quad X_n(x) = \sin(rac{n\pi}{L}x), \quad n=1,2,\ldots$$

$$\bigcirc \; \lambda_n = (rac{n\pi}{L})^2, \quad X_n(x) = \sin(rac{n\pi}{L}x), \quad n=0,1,2,\ldots$$

$$0 \hspace{0.1cm} \lambda_n = (rac{2n\pi}{L})^2, \hspace{0.3cm} X_n(x) = \sin(rac{2n\pi}{L}x), \hspace{0.3cm} n=1,2,\ldots$$

$$0$$
 $\lambda_n=(rac{n\pi}{L})^2, \quad X_n(x)=\cos(rac{n\pi}{L}x), \quad n=0,1,2,\ldots$

Additional Comments:

Which of the following is true? Select all that apply.

 $\square \ u_t = k u_{xx}$ is an inhomogeneous PDE.

Correct!

- $extstyle u_t = ku_{xx}$ is a homogeneous PDE.
- \square $u(x,0)=\sin(rac{\pi}{L}x)$ is a homogeneous initial condition.

Correct!

- $extstyle u(0,t)=\sin(t)$ is an inhomogeneous boundary condition.
- $u(0,t)=\sin(t)$ is a homogeneous boundary condition.

Additional Comments:

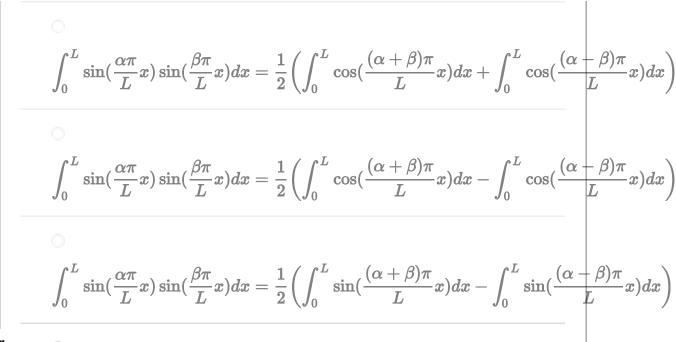
Inanswered

Question 7

0 / 0 pts

Which statement below is true?

$$\int_0^L \sin(rac{lpha\pi}{L}x)\sin(rac{eta\pi}{L}x)dx = rac{1}{2}igg(\int_0^L \sin(rac{(lpha+eta)\pi}{L}x)dx + \int_0^L \sin(rac{(lpha+eta)\pi}{L}x)dxigg)$$



orrect Answer

$$\int_0^L \sin(rac{lpha\pi}{L}x)\sin(rac{eta\pi}{L}x)dx = rac{1}{2}igg(\int_0^L \cos(rac{(lpha-eta)\pi}{L}x)dx - \int_0^L \cos(rac{(lpha+eta)\pi}{L}x)dxigg)$$
 Additional Comments:

Fudge Points:

You can manually adjust the score by adding positive or negative points to this box.

Final Score: 1 out of 1

Update Scores