Lecture 3 Activity Results for Test Student

Score for this attempt: **1** out of 1
Submitted Jan 16 at 3:06pm
This attempt took 12 minutes.

Question 1

1 / 1 pts

Which of the following is a general solution of $u''(x) = 3u(x)$? **Select all that apply**

- [ ] $u(x) = c_1 \cos(\sqrt{3}x) + c_2 \sin(\sqrt{3}x)$
- [x] $u(x) = c_1 e^{\sqrt{3}x} + c_2 e^{-\sqrt{3}x}$ — Correct!
- [x] $u(x) = c_1 e^{\sqrt{3}(x-L)} + c_2 e^{-\sqrt{3}(x-L)}$ — Correct!
- [x] $u(x) = c_1 \cosh(\sqrt{3}x) + c_2 \sinh(\sqrt{3}x)$ — Correct!
- [x] $u(x) = c_1 \cosh(\sqrt{3}(x-L)) + c_2 \sinh(\sqrt{3}(x-L))$ — Correct!

Additional Comments:

Question 2

0 / 0 pts

Recall the definition $\cosh(x) \equiv \dfrac{e^x + e^{-x}}{2}, \quad \sinh(x) \equiv \dfrac{e^x - e^{-x}}{2}.$

It follows that $\dfrac{d}{dx}\cosh(x) = \sinh(x), \quad \dfrac{d}{dx}\sinh(x) = \cosh(x).$

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

- [ ] $\dfrac{d^2}{dx^2}\cosh(\alpha x) = \cosh(\alpha x)$
  $\dfrac{d^2}{dx^2}\sinh(\alpha x) = \sinh(\alpha x)$

Correct!

- [x] $\dfrac{d^2}{dx^2}\cosh(\alpha x) = \alpha^2 \cosh(\alpha x)$
  $\dfrac{d^2}{dx^2}\sinh(\alpha x) = \alpha^2 \sinh(\alpha x)$

- [ ] $\dfrac{d^2}{dx^2}\cosh(\alpha x) = -\alpha^2 \cosh(\alpha x)$
  $\dfrac{d^2}{dx^2}\sinh(\alpha x) = -\alpha^2 \sinh(\alpha x)$

Correct!

- [x] $\dfrac{d^2}{dx^2}\cosh(\alpha(L-x)) = \alpha^2 \cosh(\alpha(L-x))$
  $\dfrac{d^2}{dx^2}\sinh(\alpha(L-x)) = \alpha^2 \sinh(\alpha(L-x))$

- [ ] $\dfrac{d^2}{dx^2}\cosh(\alpha(L-x)) = -\alpha^2 \cosh(\alpha(L-x))$
  $\dfrac{d^2}{dx^2}\sinh(\alpha(L-x)) = -\alpha^2 \sinh(\alpha(L-x))$

Additional Comments:

Question 3

0 / 0 pts

Which of the following is a particular solution of $u_{xx} + u_{yy} = 0$? **Select all that apply.**

- [ ] $u(x,y) = \sin(\frac{n\pi}{L}x)\sin(\frac{n\pi}{H}y)$
- [ ] $u(x,y) = \sin(\frac{n\pi}{L}x)\sinh(\frac{n\pi}{H}y)$

Correct!

- [x] $u(x,y) = \sin(\frac{n\pi}{L}x)\sinh(\frac{n\pi}{L}y)$
- [ ] $u(x,y) = \sin(\frac{n\pi}{L}x)\sinh(\frac{n\pi}{H}(H-y))$

Correct!

- [x] $u(x,y) = \sin(\frac{n\pi}{L}x)\sinh(\frac{n\pi}{L}(H-y))$

Additional Comments:

Question 4

0 / 0 pts

Let $u^{(1)}(x,y)$ be the solution of

$$\begin{cases} u_{xx}+u_{yy}=0 \\ u(0,y)=0, \quad u(L,y)=0 \\ u(x,0)=\cos(\frac{\pi}{L}x), \quad u(x,H)=0 \end{cases}$$

and $u^{(2)}(x,y)$ be the solution of $\begin{cases} u_{xx}+u_{yy}=0 \\ u(0,y)=0, \quad u(L,y)=0 \\ u(x,0)=0, \quad u(x,H)=1 \end{cases}$.

Find the solution of $\begin{cases} u_{xx}+u_{yy}=0 \\ u(0,y)=0, \quad u(L,y)=0 \\ u(x,0)=-3\cos(\frac{\pi}{L}x), \quad u(x,H)=5 \end{cases}$.

- $u(x,y)=u^{(1)}(x,y)+u^{(2)}(x,y)$
- $u(x,y)=3u^{(1)}(x,y)+5u^{(2)}(x,y)$
- Correct! **$u(x,y)=-3u^{(1)}(x,y)+5u^{(2)}(x,y)$**
- $u(x,y)=5u^{(1)}(x,y)+3u^{(2)}(x,y)$
- $u(x,y)=5u^{(1)}(x,y)-3u^{(2)}(x,y)$

Additional Comments:

Question 5

0 / 0 pts

Which of the following is a general solution of
$u''(x) = -c^2\lambda u(x)$ for $\lambda > 0$? **Select all that apply**

- [ ] $u(x) = c_1\cos(\sqrt{\lambda}x) + c_2\sin(\sqrt{\lambda}x)$
- [ ] $u(x) = c_1\cos(\sqrt{c\lambda}x) + c_2\sin(\sqrt{c\lambda}x)$

Correct!

- [x] $u(x) = c_1\cos(c\sqrt{\lambda}x) + c_2\sin(c\sqrt{\lambda}x)$
- [ ] $u(x) = c_1e^{\sqrt{\lambda}x} + c_2e^{-\sqrt{\lambda}x}$
- [ ] $u(x) = c_1e^{c\sqrt{\lambda}x} + c_2e^{-c\sqrt{\lambda}x}$

Additional Comments:

Question 6

0 / 0 pts

Recall that in the complex plane, we have
$e^{i(n\pi-\alpha)} = e^{in\pi}e^{-i\alpha} = (-1)^n(\cos(\alpha) + i\sin(-\alpha))$.

Use it to write $\cos(n\pi - \alpha)$ and $\sin(n\pi - \alpha)$ in terms of $\cos(\alpha)$ and $\sin(\alpha)$.

$\cos(n\pi - \alpha) = \cos(\alpha), \quad \sin(n\pi - \alpha) = \sin(\alpha)$

$\cos(n\pi - \alpha) = (-1)^n \cos(\alpha), \quad \sin(n\pi - \alpha) = (-1)^n \sin(\alpha)$

Correct!

$\cos(n\pi - \alpha) = (-1)^n \cos(\alpha), \quad \sin(n\pi - \alpha) = -(-1)^n \sin(\alpha)$

$\cos(n\pi - \alpha) = \cos(\alpha), \quad \sin(n\pi - \alpha) = -\sin(\alpha)$

$\cos(n\pi - \alpha) = -(-1)^n \sin(\alpha), \quad \sin(n\pi - \alpha) = (-1)^n \cos(\alpha)$

Additional Comments:

Question 7

0 / 0 pts

In physics, frequency refers to the number of cycles per unit time. What is the frequency of $\cos(\alpha t)$?

$\text{frequency} = \alpha$

$\text{frequency} = \frac{1}{\alpha}$

Correct!

$\text{frequency} = \frac{\alpha}{2\pi}$

- $\text{frequency} = \dfrac{2\pi}{\alpha}$
- $\text{frequency} = 2\pi$

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