

7 of 14

Suppose that $\{x, x^3\}$ is a fundamental solution set for $y'' + p(x)y' + q(x)y = 0$. If f is a solution of the initial value problem $y(1) = 0$, $y'(1) = 1$, then $f(2) =$

- 1 3 -3 0

9 of 14

Let $\mu = x^n y$ be an exact integrating factor of $ydx + 2xdy = 0$ then $n =$

- $-\frac{1}{2}$ 3 2 0

10 of 14

The general solution of $xy' + 2y = x$ is

$y = \frac{1}{3}x + cx^{-2}$ $y = \frac{1}{3}x^2 + cx^{-2}$ $y = \frac{1}{2}x + cx^{-2}$ $y = \frac{1}{5}x^2 + cx^{-3}$

11 of 14

The general form of the particular solution for the DE $y'' - 4y = \sin^2(5x)$ is

- $A + B\sin(5x) + C\cos(5x)$ $A\sin(10x) + B\cos(10x)$ $A\sin(5x) + B\cos(5x)$ $A + B\sin(10x) + C\cos(10x)$

4 of 14
 $e^x \frac{dy}{dx} + 3y = x^2y$ is

- Neither separable nor Linear Separable but not linear Linear but not separable Both separable and linear

12 of 14

If y is a solution of $y' + y = 2$, $y(0) = 0$ then $y'(0) =$

- 1 1 e 2

8 of 14
Given that the general solution of $y'' - 2by' + cy = 0$, where b and c are constants is $y = c_1e^x + c_2e^{-2x}$. Then the values of b and c are

- $b = 1, c = 2$ $b = \frac{-1}{2}, c = -2$ $b = \frac{1}{2}, c = 2$ $b = \frac{-1}{2}, c = 2$

6 of 14

The value(s) of r so that $y = x^r$ is a solution of $x^2y'' + xy' - 9y = 0$ is

- 9, -9 -1, 1 3, -3 3 only

3 of 14

Which of the following pairs of functions are linearly independent

- $f(x) = e^x, g(x) = e^{x-1}$ $f(x) = x^3, g(x) = -2x^3$ $f(x) = \cos^2 x, g(x) = \cos(2x) + 1$ $f(x) = e^x, g(x) = e^{2-x}$

2 of 14

If the wronskian $W(f,g) = 3e^{4t}$ and $f(t) = e^{2t}$ then $g(t) =$

- $3te^{2t} + ce^{2t}$ $te^t + ct$ $te^{2t} + ce^{2t}$ te^t

MATH 205 Midterm exam

1 of 14
The general solution of the exact DE $(2+5y)dx+(3+5x)dy=0$ is

- $2x+5yx+3=c$ $2x+5y=c$ $y=-2x+c$ $2x+5yx+3y=c$

نقطتان (2)

*

If $y_1 = x$ is a solution of $(x^2 + 1)y'' - 2xy' + 2y = 0$,
then a second linearly independent solution is $y_2 =$

- (A) $x^2 - 1$
- (B) x^2
- (C) e^x
- (D) $x - 1$
- (E) None



- A
- B
- C
- D
- E

- C
- D
- E

*

2 points

If $y_1 = x$ is a solution of $(1 - x^2)y'' + 2xy' - 2y = 0$,
then a second linearly independent solution is $y_2 =$

- (A) $x - 1$
- (B) $x^2 - 1$
- (C) x^2
- (D) $-(x^2 + 1)$
- (E) None

- A
- B
- C
- D
- E

Choose the true answer

*

2 points

Let $y_1 = 1$, $y_2 = x^2$ be two independent solutions of $x^2y'' - xy' = 0$, then the particular solution of

$$x^2y'' - xy' = x^3$$

is $Y(x) =$

- (A) $2x^3$
- (B) $3x^3$
- (C) $\frac{1}{3}x^3$
- (D) $\frac{1}{2}x^3$
- (E) None

- A
- B
- C
- D
- E

*

2 points



The solution of $y'' = 0$, $y(0) = 0$, $y(1) = 1$ is



Question * (3 Points)

The indicial equation of $x^2y'' + xy' + (x^2 - 4)y = 0$ at $x = 0$ is :

- (A) $r^2 - r - 4 = 0$
- (B) $r^2 = 0$
- (C) $r^2 - 4 = 0$
- (D) $r^2 + 4 = 0$
- (E) None

A

B

C

D

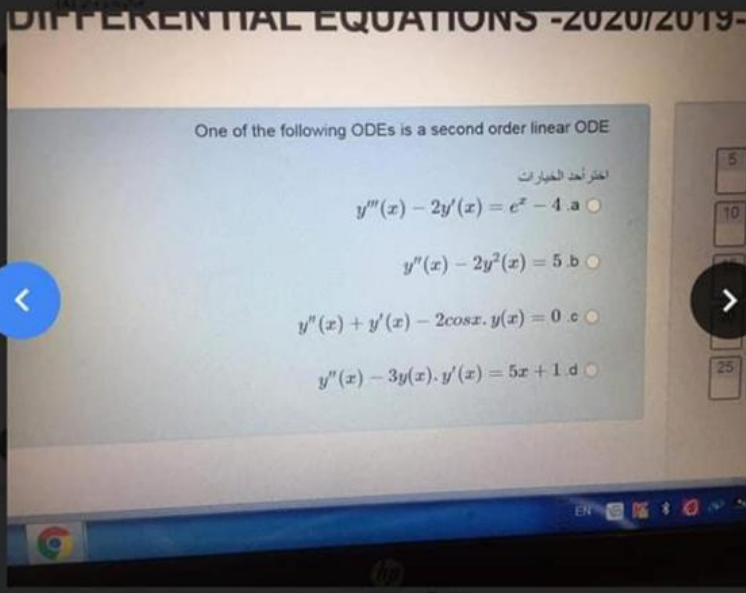
E

الملفات

11:28 AM 50% 50%

Question * (3 Points)

One of the following is not a Bernoulli D.E.



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Question * (2 Points)

Let $y(0) = \begin{cases} 1 & 0 \leq x < 1 \\ 0 & 1 \leq x < 2 \end{cases}$ Then $y(2) =$

(A) $\frac{1}{2}$

(B) $\frac{1}{4}$

(C) $\frac{1}{8}$

(D) $\frac{1}{16}$

(E) $\frac{1}{32}$

Question 3

Not yet answered

Marked out of 2.50

Flag question

The solution to the initial value problem below is:

$$y'' - \frac{1}{2}y' = 0, \quad y(0) = 0, \quad y'(1) = 1.$$

Select one:

$y(x) = x^2 + \frac{1}{2}$

$y(x) = \frac{x^2}{2}$

$y(x) = \ln(x) + 1$

$y(x) = \frac{x^2}{2} + 1$

9

DN

5 4

Question 4

Not yet answered

Marked out of 2.00

Flag question

The solution to the initial value problem below is:

$$x^2 y'' - xy' = 0, \quad y(0) = 0, \quad y'(1) = 1.$$

Select one:

$y(x) = \frac{x^2}{2}$

$y(x) = \ln(x) + 1$

$y(x) = \frac{x^2}{2} + 1$

$y(x) = x^2 + \frac{1}{2}$

Next

Question 6

Not yet answered

Marked out of 2.50

Flag question

Which of the following is a possible solution to the following ODE for some values of a, b and c :

$$ay'' + by' + cy = 0, \quad a, b, c \in \mathbb{R}, \quad a \neq 0.$$

Select one:

$c_1x^2 + c_2x^5$

$c_1e^{3x} + c_2x^2e^{-x}$

$c_1 + c_2x$

$c_1e^{2x} + c_2xe^{-x}$

Question 6
Not yet answered
Marked out of 2.50
Flag question

Which of the following is a possible solution to the following ODE for some values of a , b and c

$$ay'' + by' + cy = 0, \quad a, b, c \in \mathbb{R}, \quad a \neq 0.$$

Select one:

- $c_1x^2 + c_2x^5$
- $c_1e^{3x} + c_2x^2e^{-x}$
- $c_1 + c_2x$
- $c_1e^{3x} + c_2xe^{-x}$

Question 13

Not yet answered

Marked out of 3.00

Flag question

The general solution for the differential equation $x^3 y''' + x^2 y'' = 0$

Select one:

- A. None
- B. $y(x) = c_1 + c_2 \ln x + c_3 x \ln x$
- C. $y(x) = c_1 + c_2 x + c_3 x^2$
- D. $y(x) = c_1 + c_2 x + c_3 x \ln x$
- E. $y(x) = c_1 + c_2 x + c_3 \ln x$

Question 11

Not yet answered

Marked out of 2.00

Flag question

Let $f(t) = \delta(t - 6) + 4u_{\pi}(t)$. Then $f(5) =$

Select one:

- A. None
- B. 19
- C. 4
- D. 4π
- E. 20

Question 13

Not yet answered

Marked out of 3.00

Flag question

The general solution for the differential equation $x^3y''' + x^2y'' = 0$

Select one:

- A. None
- B. $y(x) = c_1 + c_2 \ln x + c_3 x \ln x$
- C. $y(x) = c_1 + c_2 x + c_3 x^2$
- D. $y(x) = c_1 + c_2 x + c_3 x \ln x$
- E. $y(x) = c_1 + c_2 x + c_3 \ln x$

Question 12

Not yet answered

Marked out of 3.00

Flag question

A suitable particular solution form for the differential equation

$$y'' - 2y' - 3y = 3\sinh x \quad (\text{Hint: } \sinh x = \frac{e^x - e^{-x}}{2})$$

Select one:

- A. $Y(x) = Ae^x + Be^{-x}$
- B. $Y(x) = Axe^x + Bxe^{-x}$
- C. None
- D. $Y(x) = Axe^x + Be^{-x}$
- E. $Y(x) = Ae^x + Bxe^{-x}$

Question 15

Not yet answered

Marked out of 3.00

Flag question

The functions $y_1(t) = e^{-3t}$ and $y_2(t) = te^{-3t}$ are the fundamental set of solutions for the differential equation :

Select one:

- A. $y'' - 6y' + 9y = 0$
- B. $y'' + 6y' - 6y = 0$
- C. $y'' + 6y' + 9y = 0$
- D. None
- E. $y'' + 6y' - 9y = 0$

Question 14

Not yet answered

Marked out of 3.00

Flag question

The general solution of the differential equation $y'' + 3y' = 6$ is:

Select one:

- A. $y(t) = c_1 + c_2 e^{-3t}$
- B. None
- C. $y(t) = c_1 + c_2 e^{-3t} + 2t$
- D. $y(t) = c_1 + c_2 e^{-3t} + 6$
- E. $y(t) = c_1 + c_2 e^{3t}$



Question 16
Not yet
answered
Marked out of
3.00
Flag
question

$$\mathcal{L}^{-1}[\ln(s\sqrt{s^2 + 16})]$$

Select one:

- A. None
- B. $\frac{1}{i}[1 + \cos 4t]$
- C. $1 + \cos 4t$
- D. $-\frac{1}{i}[1 + \cos 4t]$
- E. $-\frac{1}{i}[1 + \sin 4t]$

Question 13

Not yet answered

Marked out of 3.00

Flag question

The general solution for the differential equation $x^3 y''' + x^2 y'' = 0$

Select one:

- A. None
- B. $y(x) = c_1 + c_2 \ln x + c_3 x \ln x$
- C. $y(x) = c_1 + c_2 x + c_3 x^2$
- D. $y(x) = c_1 + c_2 x + c_3 x \ln x$
- E. $y(x) = c_1 + c_2 x + c_3 \ln x$

Question 12

Not yet answered

Marked out of 3.00

Flag question

A suitable particular solution form for the differential equation

$$y'' - 2y' - 3y = 3\sinh x \quad (\text{Hint: } \sinh x = \frac{e^x - e^{-x}}{2})$$

Select one:

- A. $Y(x) = Ae^x + Be^{-x}$
- B. $Y(x) = Axe^x + Bxe^{-x}$
- C. None
- D. $Y(x) = Axe^x + Be^{-x}$
- E. $Y(x) = Ae^x + Bxe^{-x}$

Question 17

Not yet answered

Marked out of 3.00

Flag question

We can write the function

$$f(t) = \begin{cases} \sin t & 0 < t < 2 \\ t & t \geq 2 \end{cases}$$

using the unit step function in the form $f(t) = \sin t + g(t)u_2(t)$ where $g(t) =$

Select one:

- A. $\sin t - t$
- B. $t - t \sin t$
- C. $t + t \sin t$
- D. $t - \sin t$
- E. None

Question 11

Not yet answered

Marked out of 2.00

Flag question

Let $f(t) = \delta(t - 6) + 4u_{\pi}(t)$. Then $f(5) =$

Select one:

- A. None
- B. 19
- C. 4
- D. 4π
- E. 20

Question 12

Not yet answered

Marked out of 3.00

Flag question

A suitable particular solution form for the differential equation

$$y'' - 2y' - 3y = 3\sinh x \quad (\text{Hint: } \sinh x = \frac{e^x - e^{-x}}{2})$$

Select one:

- A. $Y(x) = Ae^x + Be^{-x}$
- B. $Y(x) = Axe^x + Bxe^{-x}$
- C. None
- D. $Y(x) = Axe^x + Be^{-x}$
- E. $Y(x) = Ae^x + Bxe^{-x}$



Question 10
Not yet
answered
Marked out of
3.00
Flag
question

$$\mathcal{L}[e^{5t} \sin^2 t]$$

Select one:

- A. $\frac{1}{2} \left[\frac{1}{s} - \frac{s}{s^2+4} \right]$
- B. None
- C. $\frac{1}{2} \left[\frac{1}{s-5} - \frac{s-5}{(s-5)^2+4} \right]$
- D. $\frac{1}{s-5} - \frac{s-5}{(s-5)^2+4}$
- E. $\frac{1}{2} \left[\frac{1}{s-5} - \frac{2}{(s-5)^2+4} \right]$

Question 10

Not yet answered

Marked out of 3.00

Flag question

$$\mathcal{L}[e^{5t} \sin^2 t]$$

Select one:

- A. $\frac{1}{2} \left[\frac{1}{s} - \frac{s}{s^2+4} \right]$
- B. None
- C. $\frac{1}{2} \left[\frac{1}{s-5} - \frac{s-5}{(s-5)^2+4} \right]$
- D. $\frac{1}{s-5} - \frac{s-5}{(s-5)^2+4}$
- E. $\frac{1}{2} \left[\frac{1}{s-5} - \frac{2}{(s-5)^2+4} \right]$

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Question 9
Not yet answered
Marked out of 3.00
Flag question

$\mathcal{L}[u_\pi(t)\cos(t)]$

Select one:

- A. None
- B. $-\frac{s}{s^2+1}e^{-\pi s}$
- C. $\frac{1}{s^2+1}e^{-\pi s}$
- D. $-\frac{1}{s^2+1}e^{-\pi s}$
- E. $\frac{s}{s^2+1}e^{-\pi s}$

Question 10

Not yet answered

Marked out of 3.00

Flag question

$\mathcal{L}[e^{5t} \sin^2 t]$

Select one:

- A. $\frac{1}{2} \left[\frac{1}{s} - \frac{s}{s^2+4} \right]$
- B. None
- C. $\frac{1}{2} \left[\frac{1}{s-5} - \frac{s-5}{(s-5)^2+4} \right]$
- D. $\frac{1}{s-5} - \frac{s-5}{(s-5)^2+4}$
- E. $\frac{1}{2} \left[\frac{1}{s-5} - \frac{2}{(s-5)^2+4} \right]$

Question 7

Not yet

answered

Marked out of

3.00

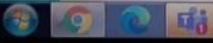
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question

$$\mathcal{L}^{-1}\left[e^{-3s} \frac{2}{s^2+4}\right]$$

Select one:

- A. $u_3(t) \sin(2t - 6)$
- B. None
- C. $u_3(t) \sin(2t)$
- D. $\sin(2t - 6)$
- E. $u_3(t) \sin(2t + 6)$



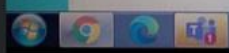
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Question 7
Not yet answered
Marked out of 3.00
Flag question

$\mathcal{L}^{-1}\left[e^{-3s} \frac{2}{s^2+4}\right]$

Select one:

- A. $u_3(t)\sin(2t - 6)$
- B. None
- C. $u_3(t)\sin(2t)$
- D. $\sin(2t - 6)$
- E. $u_3(t)\sin(2t + 6)$



Question 8

Not yet answered

Marked out of 3.00

Flag question

The differential equation $\frac{dy}{dx} + \cos x = x - y$ can be classified as:

Select one:

- A. Both linear and exact
- B. None
- C. Non exact linear
- D. Exact and separable
- E. Nonlinear exact

Question 6
Not yet
answered
Marked out of
2.00
Flag
question

Given the recurrence relation $a_{n+2} = \frac{(n-2)(n-3)}{(n+2)(n+1)} a_n$, $n = 0, 1, 2, \dots$, then

$y(x) = \sum_{n=0}^{\infty} a_n x^n$ can be reduced to:

Select one:

- A. $y(x) = a_0(3x^2) + a_1(\frac{1}{3}x^3)$
- B. $y(x) = a_0(1 - 3x) + a_1(x - \frac{1}{3}x^2)$
- C. $y(x) = a_0(1 - 3x^2) + a_1(x - \frac{1}{3}x^3)$
- D. None
- E. $y(x) = a_0(1 + 3x^2) + a_1(x + \frac{1}{3}x^3)$

Question 6

Not yet answered

Marked out of 2.00

Flag question

Given the recurrence relation $a_{n+2} = \frac{(n-2)(n-3)}{(n+2)(n+1)} a_n$, $n = 0, 1, 2, \dots$, then

$y(x) = \sum_{n=0}^{\infty} a_n x^n$ can be reduced to:

Select one:

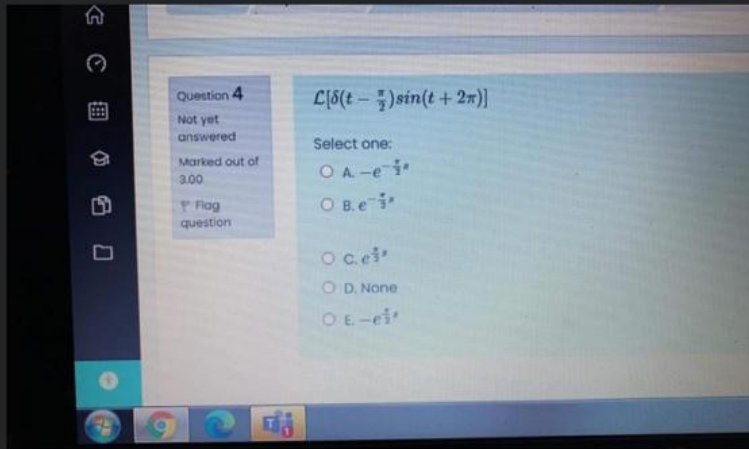
- A. $y(x) = a_0(3x^2) + a_1(\frac{1}{3}x^3)$
- B. $y(x) = a_0(1 - 3x) + a_1(x - \frac{1}{3}x^2)$
- C. $y(x) = a_0(1 - 3x^2) + a_1(x - \frac{1}{3}x^3)$
- D. None
- E. $y(x) = a_0(1 + 3x^2) + a_1(x + \frac{1}{3}x^3)$

Question 4
Not yet answered
Marked out of 3.00
Flag question

$\mathcal{L}[\delta(t - \frac{\pi}{2})\sin(t + 2\pi)]$

Select one:

- A. $-e^{-\frac{\pi}{2}s}$
- B. $e^{-\frac{\pi}{2}s}$
- C. $e^{\frac{\pi}{2}s}$
- D. None
- E. $-e^{\frac{\pi}{2}s}$



Question 5

Not yet answered

Marked out of 3.00

Flag question

The set of all singular point(s) of the differential equation

$$x^3(1-x)^2y'' + 2y' + 4xy = 0$$

Select one:

- A. 0
- B. -1
- C. 1
- D. None
- E. 0, 1



Question 3
Not yet answered
Marked out of 3.00
Flag question

If we apply the Laplace transform to the initial value problem $y'' + 5y = u_3(t), y(0) = 1, y'(0) = 0$ such that $Y(s) = \mathcal{L}[y(t)]$ We get

Select one:

- A. $Y(s) = \frac{e^{-3s}}{(s^2+5)} + \frac{s}{s^2+5}$
- B. $Y(s) = \frac{e^{-3s}}{s(s^2+5)} + \frac{s}{s^2+5}$
- C. None
- D. $Y(s) = \frac{e^{-3s}}{s(s^2+5)} + \frac{1}{s^2+5}$
- E. $Y(s) = \frac{e^{-3s}}{s(s^2+5)} - \frac{s}{s^2+5}$



Question 2
Not yet answered
Marked out of 3.00
Flag question

Consider the first order differential equation $x^2y' + x^4y = -x^5e^{2x}y^7, x > 0$ if $u = y^{-6}$, then the differential equation is reduced to $u' - 6x^3u = g(x)$ where $g(x) =$

- Select one:
- A. None
 - B. $7x^5e^{2x}$
 - C. $6x^3e^{2x}$
 - D. $6x^5e^{2x}$
 - E. $7x^3e^{2x}$

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Question 2
Not yet answered
Marked out of 3.00
Flag question

Consider the first order differential equation $x^2 y' + x^4 y = -x^5 e^{2x} y^7, x > 0$ if $u = y^{-6}$, then the differential equation is reduced to $u' - 6x^3 u = g(x)$ where $g(x) =$

- Select one:
- A. None
 - B. $7x^5 e^{2x}$
 - C. $6x^3 e^{2x}$
 - D. $6x^5 e^{2x}$
 - E. $7x^3 e^{2x}$

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Question 2

Not yet answered

Marked out of 3.00

Flag question

Consider the first order differential equation $x^2 y' + x^5 y = -x^6 e^{2x} y^7, x > 0$. If $u = y^{-6}$, then the differential equation is reduced to $u' - 6x^3 u = g(x)$ where $g(x) =$

- Select one:
- A. None
 - B. $7x^5 e^{2x}$
 - C. $6x^3 e^{2x}$
 - D. $6x^5 e^{2x}$
 - E. $7x^3 e^{2x}$

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12:30 ↗



Deema's Post

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Not yet answered

Marked out of 3.00

🚩 Flag question

$$\mathcal{L}[\delta(t - \pi)\cos(t + \pi)]$$

Select one:

- A. $-e^{-\pi s}$
- B. $e^{\pi s}$
- C. None
- D. $e^{-\pi s}$
- E. $-e^{\pi s}$

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1 Comment



Like



Comment

12:30



Deema's Post

The general solution for the differential equation $x^3 y''' + 2x^2 y'' = 0$

Select one:

- A. None
- B. $y(x) = c_1 + c_2 x + c_3 x^2$
- C.
 $y(x) = c_1 + c_2 \ln x + c_3 x \ln x$
- D.
 $y(x) = c_1 + c_2 x + c_3 x \ln x$
- E.
 $y(x) = c_1 + c_2 \ln x + c_3 x$

4 Comments

12:30



Deema's Post

The general solution for the differential equation $x^3 y''' + 2x^2 y'' = 0$

Select one:

- A. None
- B. $y(x) = c_1 + c_2 x + c_3 x^2$
- C.
 $y(x) = c_1 + c_2 \ln x + c_3 x \ln x$
- D.
 $y(x) = c_1 + c_2 x + c_3 x \ln x$
- E.
 $y(x) = c_1 + c_2 \ln x + c_3 x$

4 Comments

12:30



Deema's Post



3



Flag question

The functions $y_1(t) = e^{3t}$ and $y_2(t) = te^{3t}$ are the fundamental set of solutions for the differential equation :

Select one:

- A. None
- B. $y'' - 6y' + 6y = 0$
- C. $y'' - 6y' + 9y = 0$
- D. $y'' - 6y' - 9y = 0$
- E. $y'' + 6y' + 9y = 0$

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2 Comments

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Signal strength Zain JO

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12:32



Deema's Post

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Not yet answered

Marked out of 3.00

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$$\mathcal{L}[\delta(t - \pi)\cos(t + \pi)]$$

Select one:

- A. $-e^{-\pi s}$
- B. $e^{\pi s}$
- C. None
- D. $e^{-\pi s}$
- E. $-e^{\pi s}$

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1 Comment



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Deema's Post

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☰

🌐 🔔 💬 3 👤

The general solution for the differential equation
 $x^3 y''' + 2x^2 y'' = 0$

Select one:

A. None

B. $y(x) = c_1 + c_2 x + c_3 x^2$

C.
 $y(x) = c_1 + c_2 \ln x + c_3 x \ln x$

D.
 $y(x) = c_1 + c_2 x + c_3 x \ln x$

E.
 $y(x) = c_1 + c_2 \ln x + c_3 x$

4 Comments

12:32



Deema's Post

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The screenshot shows a mobile interface for a learning management system. At the top, there's a status bar with the name 'Zain JO', the time '12:02 PM', and a battery level of '65%'. Below that is a navigation bar with a hamburger menu icon on the left and several icons on the right: a globe, a bell, a speech bubble with a red notification badge containing the number '3', and a profile icon. The main content area features a 'Flag question' button at the top left. The question text is displayed in a light blue box: 'The functions $y_1(t) = e^{3t}$ and $y_2(t) = te^{3t}$ are the fundamental set of solutions for the differential equation :'. Below the question, it says 'Select one:' followed by five radio button options: 'A. None', 'B. $y'' - 6y' + 6y = 0$ ', 'C. $y'' - 6y' + 9y = 0$ ', 'D. $y'' - 6y' - 9y = 0$ ', and 'E. $y'' + 6y' + 9y = 0$ '. At the bottom of the question box, there are two buttons: 'Previous page' (disabled) and 'Next page' (active).

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The differential equation
 $-x \frac{dy}{dx} + \cos x = y - x$ can be classified as:

Select one:

- A. None
- B. Nonlinear exact
- C. Exact and separable
- D. Both linear and exact
- E. Non exact linear

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3



Consider the first order differential equation

$$x^2 y' + x^5 y = -x^5 e^{2x} y^7, x > 0$$

If $u = y^{-6}$, then the differential equation is reduced to $u' - 6x^3 u = g(x)$ where $g(x) =$

Select one:

- A. $6x^5 e^{2x}$
- B. $7x^5 e^{2x}$
- C. None
- D. $7x^3 e^{2x}$
- E. $6x^3 e^{2x}$

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$$\mathcal{L}^{-1}\left[e^{-3s} \frac{2}{s^2+4}\right]$$

Select one:

- A. None
- B. $\sin(2t - 6)$
- C. $u_3(t)\sin(2t + 6)$
- D. $u_3(t)\sin(2t)$
- E. $u_3(t)\sin(2t - 6)$

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3



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$$\mathcal{L}^{-1}[\ln(s\sqrt{s^2 + 25})]$$

Select one:

- A. $\frac{1}{t}[1 + \cos 5t]$
- B. $-\frac{1}{t}[1 + \cos 5t]$
- C. $1 + \cos 5t$
- D. $-\frac{1}{t}[1 + \sin 5t]$
- E. None

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A suitable particular solution form for the differential equation

$$y'' - 2y' - 3y = 3\cosh x$$

(Hint: $\cosh x = \frac{e^x + e^{-x}}{2}$)

Select one:

- A. $Y(x) = Axe^x + Be^{-x}$
- B. $Y(x) = Ae^x + Bxe^{-x}$
- C. None
- D. $Y(x) = Axe^x + Bxe^{-x}$
- E. $Y(x) = Ae^x + Be^{-x}$

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$\mathcal{L}[e^t \cos^2 t]$

Select one:

A. $\frac{1}{2} \left[\frac{1}{s} + \frac{s}{s^2+4} \right]$

B. $\frac{1}{2} \left[\frac{1}{s-1} + \frac{s-1}{(s-1)^2+4} \right]$

C. $\frac{1}{s-1} + \frac{s-1}{(s-1)^2+4}$

D. None

E. $\frac{1}{2} \left[\frac{1}{s-1} + \frac{2}{(s-1)^2+4} \right]$

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Let $f(t) = \delta(t - 5) + 3u_{\pi}(t)$.
Then $f(6) =$

Select one:

- A. 19
- B. 18
- C. 3π
- D. 3
- E. None

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If we apply the Laplace transform to the initial value problem

$$y'' + 5y = u_3(t), y(0) = 0, y'(0) = 1$$

such that $Y(s) = \mathcal{L}[y(t)]$

We get

Select one:

A. $Y(s) = \frac{e^{-3s}}{s(s^2+5)} + \frac{s}{s^2+5}$

B. $Y(s) = \frac{e^{-3s}}{s(s^2+5)} - \frac{s}{s^2+5}$

C. $Y(s) = \frac{e^{-3s}}{s(s^2+5)} + \frac{1}{s^2+5}$

D. None

E. $Y(s) = \frac{e^{-3s}}{(s^2+5)} + \frac{s}{s^2+5}$

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$\mathcal{L}[u_{\frac{\pi}{2}}(t)\cos(t)]$

Select one:

- A. None
- B. $-\frac{1}{s^2+1}e^{-\frac{\pi}{2}s}$
- C. $\frac{s}{s^2+1}e^{-\frac{\pi}{2}s}$
- D. $\frac{1}{s^2+1}e^{-\frac{\pi}{2}s}$
- E. $-\frac{s}{s^2+1}e^{-\frac{\pi}{2}s}$

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The general solution of the differential equation $y'' + 3y' = 6$ is :

Select one:

- A. None
- B. $y(t) = c_1 + c_2 e^{-3t} + 2t$
- C. $y(t) = c_1 + c_2 e^{-3t} + 6$
- D. $y(t) = c_1 + c_2 e^{3t}$
- E. $y(t) = c_1 + c_2 e^{-3t}$

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Signal strength, Zain JO, Wi-Fi

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The set of all singular point(s)
of the differential equation

$$x^3(1+x)^2y'' + 2y' + 4xy = 0$$

Select one:

- A. 1
- B. None
- C. 0, -1
- D. 0
- E. -1

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Given the recurrence relation
$$a_{n+2} = -\frac{(n-2)(n-3)}{(n+2)(n+1)}a_n, n = 0, 1, 2, \dots,$$

then
$$y(x) = \sum_{n=0}^{\infty} a_n x^n$$
 can be reduced to :

Select one:

A.
$$y(x) = a_0(1 - 3x^2) + a_1(x - \frac{1}{3}x^3)$$

B.
$$y(x) = a_0(3x^2) + a_1(\frac{1}{3}x^3)$$

C. None

D.
$$y(x) = a_0(1 - 3x) + a_1(x - \frac{1}{3}x^2)$$

E.
$$y(x) = a_0(1 + 3x^2) + a_1(x + \frac{1}{3}x^3)$$

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We can write the function

$$f(t) = \begin{cases} cost & 0 < t < 2 \\ t & t \geq 2 \end{cases}$$

using the unit step function in the form

$$f(t) = cost + g(t)u_2(t) \text{ where } g(t) =$$

Select one:

- A. $t + tcost$
- B. $t - cost$
- C. $cost - t$
- D. $t - tcost$
- E. None

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Consider
 $ty' + (t + 1)y = t, t > 0$. Then
a suitable integrating factor is
given by :

Select one:

- A. $\phi(t) = \frac{e^t}{t}$
- B. $\phi(t) = -te^t$
- C. None
- D. $\phi(t) = te^t$
- E. $\phi(t) = te^{-t}$

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