



منصة شؤون عسكرية وأمنية

من لقاء لي على قناة الأقصى



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Question 10

Complete

Mark 0 out of 1

Flag question

Solve the initial value problem

$$y'' = 10y^4, \quad y(0) = 1, \quad y'(0) = 2$$

Select one:

☐ $y = \frac{1}{(3t - 1)^{2/3}}$

☒ $y = \frac{1}{(3t + 1)^{2/3}}$

☐ $y = \frac{1}{(6t - 1)^{2/3}}$

☐ None of the given answers is true

☐ $y = \frac{1}{(6t + 1)^{2/3}}$

The correct answer is:

$$y = \frac{1}{(3t - 1)^{2/3}}$$



Flag question

Solve the equation

$$t^4 y'' + 4t^3 y' = 2, \quad t > 0.$$

Select one:

- ☒ $y = \frac{-1}{t^2} - \frac{c_1}{3t^3} + c_2$
- ☐ $y = \frac{-2}{t} - \frac{c_1}{2t^2} + c_2$
- ☐ $y = \frac{1}{t^2} - \frac{c_1}{3t^3} + c_2$
- ☐ $y = \frac{2}{t} - \frac{c_1}{2t^2} + c_2$
- ☐ None of the given answers is true

The correct answer is:

$$y = \frac{-1}{t^2} - \frac{c_1}{3t^3} + c_2$$

Question 12

Complete

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Question 12

Complete

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Which of the following sets forms a fundamental set of solutions of the linear homogeneous differential equation

$$t(2+t)y'' - (2-t^2)y' - 2(1+t)y = 0$$

Select one:

- ☐ $y_1 = 2e^{-t}, \quad y_2 = e^{-t}$
- ☐ $y_1 = t^2, \quad y_2 = 2t^2$
- ☐ none of the given answers is true
- ☒ $y_1 = t^2, \quad y_2 = e^{-t}$
- ☐ $y_1 = t^2 + 1, \quad y_2 = e^{-t}$

The correct answer is:

$$y_1 = t^2, \quad y_2 = e^{-t}$$



Question 10

Complete

Mark 0 out of 1

Flag question

Find the solution of the initial value problem

$$y'' - 4y' + 4y = 0, \quad y(0) = -1, \quad y'(0) = -1.$$

Select one:

- ☐ $y = -e^{2t} - te^{2t}$
- ☐ $y = -e^{2t} - 2te^{2t}$



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Question 13

Complete

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Find the largest interval in which the solution of the initial value problem

$$(t + 1)y'' + \ln |t| y' + \sin(t) y = e^{2t}$$

is certain to exist.

Select one:

- ☐ $(-1, \infty)$
- ☐ none of the given answers is true
- ☐ $(-\infty, -1)$
- ☒ $(0, \infty)$
- ☐ $(-1, 0)$

The correct answer is: $(0, \infty)$

Question 14

Complete



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Question 17

Complete

Mark 1 out of 1

Flag question

Find a suitable form for particular solution of the differential equation

$$y'' + 2y' + 2y = e^t(2t + 1) + e^t[\cos(2t) - \sin(2t)].$$

Select one:

☐ $y_p = e^t(A_1t + A_0) + te^t[B_0 \cos(2t) + C_0 \sin(2t)]$



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Use the method of reduction of order to find the general of the differential equation

$$(t^2 + 2)y'' - 2ty' + 2y = 24t(t^2 + 2)^{\frac{1}{2}}$$

where $y_1(t) = t$ is a solution of

$$(t^2 + 2)y'' - 2ty' + 2y = 0.$$

Select one:

- ☐ $y = c_1t + c_2(t^2 - 2) + 2t^5 - 8t^3$
- ☐ $y = c_1t + c_2(t^2 + 2) + 2t^5 - 8t^3$
- ☐ $y = c_1t + c_2(t^2 + 2) + 2t^5 + 8t^3$
- ☐ none of the given answers is true
- ☒ $y = c_1t + c_2(t^2 - 2) + 2t^5 + 8t^3$

The correct answer is:

$$y = c_1t + c_2(t^2 - 2) + 2t^5 + 8t^3$$



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Select one:

- ☐ $y_p = e^t(A_1 t + A_0) + te^t [B_0 \cos(2t) + C_0 \sin(2t)]$
- ☒ $y_p = e^t(A_1 t + A_0) + e^t [B_0 \cos(2t) + C_0 \sin(2t)]$
- ☐ none of the given answers is true
- ☐ $y_p = te^t(A_1 t + A_0) + te^t [B_0 \cos(2t) + C_0 \sin(2t)]$
- ☐ $y_p = te^t(A_1 t + A_0) + e^t [B_0 \cos(2t) + C_0 \sin(2t)]$



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Select one.

- ☐ $y = -e^{2t} - te^{2t}$
- ☐ $y = -e^{2t} - 2te^{2t}$
- ☐ $y = -e^{2t} + 2te^{2t}$
- ☐ none of the given answers is true
- ☒ $y = -e^{2t} + te^{2t}$

The correct answer is: $y = -e^{2t} - te^{2t}$

Question 16

Complete

Mark 1 out of 1

🚩 Flag question

Find the general solution of the differential equation

$$y'' + 3y' - 10y = 0.$$

Select one:

- ☒ $y = c_1 e^{2t} + c_2 e^{-5t}$
- ☐ none of the given answers is true
- ☐ $y = c_1 e^{-2t} + c_2 e^{-5t}$
- ☐ $y = c_1 e^{-2t} + c_2 e^{5t}$
- ☐ $y = c_1 e^{2t} + c_2 e^{5t}$

The correct answer is:

$$y = c_1 e^{2t} + c_2 e^{-5t}$$

Question 17

Complete

Mark 1 out of 1

Question 5

Complete

Mark 1 out of 1

🚩 Flag question

Which of the following differential equations is homogeneous?

Select one:

☐ $y' = \frac{ty}{2t^3 - y^3}$

☐ $y' = \frac{2t^2y^2}{2t^3 - y^3}$

☒ $y' = \frac{ty^2}{2t^3 - y^3}$

☐ $y' = \frac{ty^3}{2t^3 - y^3}$

☐ none of the given equations

The correct answer is:

$$y' = \frac{ty^2}{2t^3 - y^3}$$

Solve the equation $y(4 \cos x + \sin x)dx + 3(1 + 4 \sin x - \cos x)dy = 0$

Select one:

- ☐ None of the given answers is true
- ☐ $y^3 + 4y^3 \sin x + y^3 \cos x = c$
- ☐ $y^3 - 4y^3 \sin x - y^3 \cos x = c$
- ☐ $y^3 - 4y^3 \sin x + y^3 \cos x = c$
- ☒ $y^3 + 4y^3 \sin x - y^3 \cos x = c$



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Question 7

Complete

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Flag question

Find the solution of the differential equation

$$4y' + 5y = \frac{5 \sin(2t)}{y^3}.$$

Select one:

- ☐ $y^4 = \frac{3}{13} [3 \sin(2t) - 2 \cos(2t)]$
- ☐ $y^4 = \frac{3}{13} [3 \cos(2t) - 2 \sin(2t)]$
- ☐ none of the given answers
- ☐ $y^4 = \frac{5}{29} [5 \cos(2t) - 2 \sin(2t)]$
- ☒ $y^4 = \frac{5}{29} [5 \sin(2t) - 2 \cos(2t)]$

The correct answer is:

$$y^4 = \frac{5}{29} [5 \sin(2t) - 2 \cos(2t)] + ce$$

Determine the order of the differential equation and state whether the equation is linear or nonlinear:

$$\frac{d^3 y}{dt^3} + y \frac{d^2 y}{dt^2} + (t^2 + 1) \frac{dy}{dt} + (1 + \ln t)y = \sin t$$

Select one:

- ☐ First order linear equation
- ☐ Second order nonlinear equation
- ☐ Second order linear equation
- ☐ Third order linear equation
- ☒ Third order nonlinear equation

Question 5

Complete

Mark 1 out of 1

🚩 Flag question

Which of the following differential equations is homogeneous?

Select one:

☐ $y' = \frac{ty}{2t^3 - y^3}$

☐ $y' = \frac{2t^2y^2}{2t^3 - y^3}$

☒ $y' = \frac{ty^2}{2t^3 - y^3}$

☐ $y' = \frac{ty^3}{2t^3 - y^3}$

☐ none of the given equations

The correct answer is:

$y' = \frac{ty^2}{2t^3 - y^3}$



Question 8

Complete

Mark 1 out of 1

Flag question

The solution of the IVP

$$t(t+2)y' + (t+2)y = t^2, \quad y(1) = 0$$

exists in the interval

Select one:

- ☒ $(0, \infty)$
- ☐ $(-2, 0)$
- ☐ $(-2, \infty)$
- ☐ none of the given answers is true
- ☐ $(-\infty, -2)$

The correct answer is: $(0, \infty)$

Question 9

Complete

Mark 1 out of 1

Flag question

Question 6

Complete

Mark 1 out of 1

🚩 Flag question

Find the solution of the differential equation

$$y' - y^2 \cos(3t) = 0.$$

Select one:

- ☐ $y = \frac{-3}{\cos(3t) + c}$
- ☐ none of the given answers is true
- ☐ $y = \frac{3}{\cos(3t) + c}$
- ☒ $y = \frac{-3}{\sin(3t) + c}$
- ☐ $y = \frac{3}{\sin(3t) + c}$

The correct answer is:

$$y = \frac{-3}{\sin(3t) + c}$$



If $y = (t + c)^{1/3}$, where c is a constant, then y is a solution of the equation

Select one:

- ☐ $2y' = y^{-1}$
- ☐ $2y' = y^{-3}$
- ☐ $3y' = y^{-4}$
- ☐ none of the given equations
- ☒ $3y' = y^{-2}$

The correct answer is:

$$3y' = y^{-2}$$

Question 3

Complete

Mark 1 out of 1





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Find the solution of the differential equation

$$y' + 5y = \frac{5 \sin(2t)}{y^3}.$$

Select one:

$$y^4 = \frac{3}{13} [3 \sin(2t) - 2 \cos(2t)] + ce^{-3t}$$

$$y^4 = \frac{3}{13} [3 \cos(2t) - 2 \sin(2t)] + ce^{-3t}$$

none of the given answers

$$y^4 = \frac{5}{29} [5 \cos(2t) - 2 \sin(2t)] + ce^{-5t}$$

$$y^4 = \frac{5}{29} [5 \sin(2t) - 2 \cos(2t)] + ce^{-5t}$$

The correct answer is:

$$y^4 = \frac{5}{29} [5 \sin(2t) - 2 \cos(2t)] + ce^{-5t}$$

Determine the order of the differential equation and state whether the equation is linear or nonlinear:

$$\frac{d^3 y}{dt^3} + y \frac{d^2 y}{dt^2} + (t^2 + 1) \frac{dy}{dt} + (1 + \ln t)y = \sin t$$

Select one:

- ☐ First order linear equation

Question 4

Complete

Mark 1 out of 1

🚩 Flag question

Find the solution of the initial value problem

$$ty' + 3y = 2t^3, \quad y(1) = -2.$$

Select one:

- ☒ $y(t) = \frac{1}{3}t^3 - \frac{7}{3t^3}$
- ☐ $y(t) = t^3 - \frac{3}{t^3}$
- ☐ $y(t) = -2t^3$
- ☐ none of the given answers is true
- ☐ $y(t) = \frac{1}{6}t^3 - \frac{13}{6t^3}$

The correct answer is:

$$y(t) = \frac{1}{3}t^3 - \frac{7}{3t^3}$$

Question 3

Complete

Mark 1 out of 1

🚩 Flag question

Find an integrating factor for the differential equation

$$ty' + (4t + 4)y = t^4.$$

Select one:

- ☐ $t^2 e^{-4t}$
- ☐ $t^2 e^{4t}$
- ☒ $t^4 e^{4t}$
- ☐ $t^4 e^{-4t}$
- ☐ None of these answers

The correct answer is: $t^4 e^{4t}$

Question 4

Complete

Mark 1 out of 1

🚩 Flag question

- ☐ $y^3 - 4y^3 \sin x - y^3 \cos x = c$
- ☐ $y^3 - 4y^3 \sin x + y^3 \cos x = c$
- ☒ $y^3 + 4y^3 \sin x - y^3 \cos x = c$

The correct answer is: $y^3 + 4y^3 \sin x - y^3 \cos x = c$

Question 10

Complete

Mark 0 out of 1

Find the Wronskian of two solutions of the differential equation without solving the equation:

$$t^2 y'' - t(3t + 2)y' + y = 0.$$

Select one:

- ☐ $W(t) = c(3t + 2 \ln |t|)$
- ☐ $W(t) = ce^{t^3+t^2}$
- ☐ none of the given answers is true
- ☒ $W(t) = ct^2 e^{3t}$
- ☐ $W(t) = ct^{-2} e^{-3t}$