Question 1

Not yet answered

Marked out of 10.00

Flag question

Determine one possible Jordan Canonical Forms J that similar to $A \in \mathcal{M}_4(\mathbb{R})$ whose minimal polynomial is $m_A(\lambda) = (\lambda + 1)(\lambda + 5)^3$.

Select one:

a.
$$J = \begin{pmatrix} -5 & 1 & 0 & 0 \\ 0 & -5 & 1 & 0 \\ 0 & 0 & -5 & 0 \\ 0 & 0 & 0 & -1 \end{pmatrix}$$

b.
$$J = \begin{pmatrix} -5 & 1 & 0 & 0 \\ 0 & -5 & 0 & 0 \\ 0 & 0 & -5 & 0 \\ 0 & 0 & 0 & -1 \end{pmatrix}$$

c.
$$J = \begin{pmatrix} -1 & 1 & 0 & 0 \\ 0 & -1 & 1 & 0 \\ 0 & 0 & -1 & 0 \\ 0 & 0 & 0 & -5 \end{pmatrix}$$

d.
$$J = \begin{pmatrix} -5 & 1 & 0 & 0 \\ 0 & -5 & 1 & 0 \\ 0 & 0 & -5 & 0 \\ 0 & 0 & 0 & -5 \end{pmatrix}$$

Question **2**

Not yet answered

Marked out of 10.00

Flag question

Solve the differential equation $\dfrac{dy}{dt} = e^{2t-y} + t^3 e^{-y}$.

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- a. $4e^y = 2e^{2t} + t^4 + C$
- b. $e^{3yt} = 2e^t + t^2 + C$
- c. $(y+t)(1+e^{y-t}) = ce^y$
- d. $e^{2y} = 2e^t + t^2 + C$
- e. $4te^y = 2e^{-t} + t^4 + C$

Clear my choice

Question **3**

Not yet answered

Marked out of 10.00

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Solve the differential equation

$$t\frac{dy}{dt} + y = y^2 \ln t$$

- a. $\dfrac{1}{y} = Ct + \ln t + 1$
- b. $\dfrac{1}{y^2} = Cyt + \ln t + 1$
- c. $\dfrac{1}{y} = Cyt + \ln t + 1$
- d. $y = Ct + \ln t + 1$

Question **4**

Not yet answered

Marked out of 10.00

Flag question

There are 10000 people living in a certain city. Suppose that the rate of population growth in the city is proportional to the number of inhabitants. Suppose that 10% of the original amount increase in 20 years, how much will the population in the city after 60 years?

Select one:

- a. 13310
- b. 13000
- c. 12000
- d. 13200

Question **5**

Not yet answered

Marked out of 10.00

Flag question

Let $A \in \mathcal{M}_3(\mathbb{R})$ with $\mathrm{tr}(A) = 0$. Suppose that $\lambda = 1$ is an eigenvalue of A and E_1 spanned by $(1, 0, 1)$ and $(-1, 2, 3)$. Find $p(\lambda)$, the characteristic polynomial of A.

Select one:

- a. $p(\lambda) = -(\lambda - 1)^2(\lambda + 2)$
- b. $p(\lambda) = -(\lambda - 5)(\lambda + 1)^2$
- c. $p(\lambda) = -(\lambda - 5)^2(\lambda - 1)$
- d. $p(\lambda) = -(\lambda - 5)^3$