

WebAssign

CH 8.4 - 2 (Homework)

Yinglai Wang
MA 265 Spring 2013, section 132, Spring 2013
Instructor: Alexandre Eremenko

Current Score : 20 / 20 Due : Thursday, April 25 2013 11:40 PM EDT

The due date for this assignment is past. Your work can be viewed below, but no changes can be made.

Important! Before you view the answer key, decide whether or not you plan to request an extension. Your Instructor may *not* grant you an extension if you have viewed the answer key. Automatic extensions are not granted if you have viewed the answer key.

[Request Extension](#) [View Key](#)

1. 6.66/6.66 points | [Previous Answers](#)

KolmanLinAlg9 8.4.003.

Find the general solution to the linear system of differential equations. (Enter each vector in the form $[x_1, x_2, \dots]$. Use b_1, b_2, \dots for any arbitrary constants.)

$$\begin{bmatrix} x'_1 \\ x'_2 \\ x'_3 \end{bmatrix} = \begin{bmatrix} 2 & 0 & 0 \\ 3 & -4 & 0 \\ 2 & 1 & 3 \end{bmatrix} \begin{bmatrix} x_1 \\ x_2 \\ x_3 \end{bmatrix}$$

$\mathbf{x}(t) =$



2. 6.66/6.66 points | [Previous Answers](#)

KolmanLinAlg9 8.4.008.

Find the general solution to the linear system of differential equations. (Enter each vector in the form $[x_1, x_2, \dots]$. Use b_1, b_2, \dots for any arbitrary constants.)

$$\begin{bmatrix} x'_1 \\ x'_2 \\ x'_3 \end{bmatrix} = \begin{bmatrix} 1 & 1 & 4 \\ 0 & 1 & 0 \\ 0 & 1 & 5 \end{bmatrix} \begin{bmatrix} x_1 \\ x_2 \\ x_3 \end{bmatrix}$$

$\mathbf{x}(t) =$



3. 6.68/6.68 points | [Previous Answers](#)

KolmanLinAlg9 8.4.009.

Consider two competing species that live in the same forest, and let $x_1(t)$ and $x_2(t)$ denote the respective populations of the species at time t . Suppose that the initial populations are $x_1(0) = 400$ and $x_2(0) = 300$. If the growth rates of the species are given by

$$x'_1(t) = -3x_1(t) + 6x_2(t)$$

$$x'_2(t) = x_1(t) - 2x_2(t),$$

what is the population of each species at time t ?

$$x_1(t) =$$



$$x_2(t) =$$

