F16 8:40 Final Exam Problem 1
Linear Algebra, Dave Bayer

test1a3p1

[Reserved for Score]

Test 1

Name ______________________ Uni ______________

[1] Find the intersection of the following two affine subspaces of $\mathbb{R}^3$.

$$\begin{bmatrix} x \\ y \\ z \end{bmatrix} = \begin{bmatrix} 1 \\ 1 \\ 1 \end{bmatrix} + \begin{bmatrix} 0 \\ 1 \\ -1 \end{bmatrix} t \qquad\qquad x + z = 3$$

$$\begin{bmatrix} x \\ y \\ z \end{bmatrix} =$$

test1a3p2

[Reserved for Score]

Test 1

[2] Find the inverse to the matrix

$$A = \begin{bmatrix} 1 & 3 & 4 \\ 2 & 2 & 3 \\ 0 & 1 & 2 \end{bmatrix}$$

$$A^{-1} = \frac{1}{+\square} \begin{bmatrix} \square & \square & \square \\ \square & \square & \square \\ \square & \square & \square \end{bmatrix}$$

F16 8:40 Final Exam Problem 3
Linear Algebra, Dave Bayer

test1a3p3

[Reserved for Score]

Test 1

[3] Find A^n where A is the matrix

$$A = \begin{bmatrix} 0 & 2 \\ 3 & -1 \end{bmatrix}$$

$$A^n = \frac{\square}{\square} \begin{bmatrix} \square & \square \\ \square & \square \end{bmatrix} + \frac{\square}{\square} \begin{bmatrix} \square & \square \\ \square & \square \end{bmatrix}$$

test1a3p4

[Reserved for Score]

Test 1

[4] Find A^n where A is the matrix

$$A = \begin{bmatrix} -3 & 2 \\ -2 & 1 \end{bmatrix}$$

$$A^n = \frac{\square}{\square} \begin{bmatrix} \square & \square \\ \square & \square \end{bmatrix} + \frac{\square}{\square} \begin{bmatrix} \square & \square \\ \square & \square \end{bmatrix}$$

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test1a3p5

[Reserved for Score]

Test 1

[5] Find A^n where A is the matrix

$$A = \begin{bmatrix} 1 & 1 & 0 \\ 1 & 1 & 0 \\ 2 & 1 & 1 \end{bmatrix}$$

$$A^n = \frac{\square}{\square}\begin{bmatrix} \square & \square & \square \\ \square & \square & \square \\ \square & \square & \square \end{bmatrix} + \frac{\square}{\square}\begin{bmatrix} \square & \square & \square \\ \square & \square & \square \\ \square & \square & \square \end{bmatrix} + \frac{\square}{\square}\begin{bmatrix} \square & \square & \square \\ \square & \square & \square \\ \square & \square & \square \end{bmatrix}$$

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Linear Algebra, Dave Bayer

test1a3p6

[Reserved for Score]

Test 1

[6] Find e^{At} where A is the matrix

$$A = \begin{bmatrix} 2 & 2 & 1 \\ -1 & -2 & -2 \\ 1 & 3 & 3 \end{bmatrix}$$

$$e^{At} = \frac{\square}{\square}\begin{bmatrix} \square & \square & \square \\ \square & \square & \square \\ \square & \square & \square \end{bmatrix} + \frac{\square}{\square}\begin{bmatrix} \square & \square & \square \\ \square & \square & \square \\ \square & \square & \square \end{bmatrix} + \frac{\square}{\square}\begin{bmatrix} \square & \square & \square \\ \square & \square & \square \\ \square & \square & \square \end{bmatrix}$$

F16 8:40 Final Exam Problem 7
Linear Algebra, Dave Bayer

test1a3p7

[Reserved for Score]

Test 1

[7] Solve the differential equation $y' = Ay$ where

$$A = \begin{bmatrix} 1 & 1 & 1 \\ 1 & 2 & 0 \\ 0 & 1 & 2 \end{bmatrix}, \qquad y(0) = \begin{bmatrix} 0 \\ 1 \\ 1 \end{bmatrix}$$

$$y = \frac{\square}{\square}\begin{bmatrix} \square \\ \square \\ \square \end{bmatrix} + \frac{\square}{\square}\begin{bmatrix} \square \\ \square \\ \square \end{bmatrix} + \frac{\square}{\square}\begin{bmatrix} \square \\ \square \\ \square \end{bmatrix}$$

F16 8:40 Final Exam Problem 8
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test1a3p8

[Reserved for Score]

Test 1

[8] Express the quadratic form

$$2x^2 - 2xy + 3y^2 + 2yz + 2z^2$$

as a sum of squares of orthogonal linear forms.

$$\boxed{}\left(\boxed{}\right)^2 + \boxed{}\left(\boxed{}\right)^2 + \boxed{}\left(\boxed{}\right)^2$$