Name _____

Advanced Math Functions & Statistics Honors Review: Unit 6: Matrices

Non- Graphing Calculator Section

Multiple Choice (3 points each)

1. For R, S, and T as defined below, write all of the products that may be obtained.

$R = \begin{bmatrix} 1 & 2 \\ -4 & 1 \end{bmatrix}$ $S = \begin{bmatrix} 0 \\ 2 \end{bmatrix}$ $T = [1 \quad -2]$

2. Write a matrix equation equivalent to the system of equations shown below.

$$6x - 5y = 17$$
$$2x + 3y - z = 11$$
$$x - 4z = -8$$

3. What is the product of A and A^{-1}?
   a. If A is a 2x2 matrix

   b. If A is a 3x3 matrix

   c. If A is a 4x4 matrix

4. Find $A + B$ if $A = \begin{bmatrix} 5 & 7 & -2 \\ 4 & 0 & -3 \end{bmatrix}$ and $B = \begin{bmatrix} -5 & 2 & -1 \\ 10 & -6 & -2 \end{bmatrix}$.

5. Find EF if $E = \begin{bmatrix} 3 & 1 \\ -1 & 2 \end{bmatrix}$ and $F = \begin{bmatrix} -1 & -2 \\ 2 & 1 \end{bmatrix}$.

6. Find the value of the determinant of $\begin{bmatrix} 7 & 3 \\ 5 & 2 \end{bmatrix}$.

7. Find the inverse of $\begin{bmatrix} 5 & 2 \\ 3 & 0 \end{bmatrix}$, if it exists.

8. Write a product to represent the solution to the system. $\begin{bmatrix} 2 & 3 \\ 4 & -1 \end{bmatrix} \cdot \begin{bmatrix} x \\ y \end{bmatrix} = \begin{bmatrix} 3 \\ 2 \end{bmatrix}$

9. $-2\begin{bmatrix} 3 & -5 \\ 7 & 1 \end{bmatrix} + \begin{bmatrix} -4 & 5 \\ 2 & 3 \end{bmatrix}$ = ?

10. Find $B - A$ if $A = \begin{bmatrix} 6 & 3 & 2 \\ -3 & 4 & 0 \end{bmatrix}$ and $B = \begin{bmatrix} -5 & 4 & -3 \\ 8 & -2 & 1 \end{bmatrix}$.

11. The dimensions of matrix A is 3 x 4. If BA exists, what could be the dimensions of matrix B?

12. The dimensions of matrix A is 2 x 3. If A - B exists, what could be the dimensions of matrix B?

Graphing Calculator Section

13. Solve:
$$\begin{aligned} -3x+6y+1z &= 27 \\ 5x+1y-1z &= 1 \\ -6x+5y+3z &= 29 \end{aligned}$$

14. Find the values of *x* and *y* for which $\begin{bmatrix} y \\ 2x \end{bmatrix} = \begin{bmatrix} 2x+2 \\ 3y+6 \end{bmatrix}$ is true.

15. For two 2×2 matrices, A and B, the element in the second row and second column of the product matrix AB is the sum of the products of the corresponding element in the

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16. Mr. Lester used 68 meters of fencing to enclose a rectangular chicken coop. The length of the coop is 4 times the width. Write a matrix equation that could be used to find the coop's length, *l*, and width, *w*.

17. Two different campus organizations scheduled seafood parties. Both paid the same price per dozen crabs and the same price per pound of shrimp. The first group bought 5 dozen crabs and 75 pounds of shrimp for a total of $600. The second bought 12 dozen crabs and 75 pounds of shrimp for $915. How many pounds of shrimp would have cost the same amount as 6 dozen crabs?

18. Write a system of equation that the following matrix equation may represent.

$$\begin{bmatrix} 8 & 3 & 1 \\ -3 & 2 & 0 \\ 6 & 1 & -5 \end{bmatrix} \begin{bmatrix} a \\ b \\ c \end{bmatrix} = \begin{bmatrix} 12 \\ -18 \\ 15 \end{bmatrix}$$

19. For which matrix operations does the order of the matrices **NOT** matter?

20. For a system of equations with four different variables, what will the dimensions of the **constant matrix** be?

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Advanced Math Functions & Statistics Honors Review: Unit 6: Matrices

Constructed Response- Graphing Calculator Section (10 pts each)

Task 1:

Suppose that on the first day of a sale, a store sold 38 flat screen televisions , 53 laptops, and 25 cameras. During the second day, 22 flat screen tvs, 44 laptops, and 15 cameras were sold. On day three of the sale, the store sold 21 tvs, 26 laptops, and 18 cameras. Total sales for these items for the three days were $52,334; $33,549; and $28,675 respectively. What was the unit cost of each of these two selected items?

A. Write a linear system of equations to represent this situation.

B. Create a matrix equation to represent this situation.

C. Use a graphing calculator to solve the matrix equation.

D. Interpret the solutions in the context of this problem. (use complete sentences)

Task 2:

$$A = \begin{bmatrix} 5 & 1 & -2 \\ 3 & -2 & -1 \\ 4 & 6 & 0 \end{bmatrix}$$

1. What is the value of A_{23}?

2. What two elements of matrix A have the same value (use subscript notation)

3. Find *det* A

4. Find A^{-1}

5. Find -5A

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Advanced Math Functions & Statistics Honors Review: Unit 6: Matrices

Non- Graphing Calculator Section (10 pts each)

Task 3:

Use the given matrices to evaluate each expression or explain why it is not possible. **Show all work!**

$A = \begin{bmatrix} 4 & -1 \\ 1 & 5 \\ 2 & 6 \end{bmatrix}$ $B = \begin{bmatrix} 2 & 0 & -3 \\ 4 & -3 & 2 \end{bmatrix}$ $C = \begin{bmatrix} 7 & -5 \\ 0 & 1 \\ 8 & 4 \end{bmatrix}$ $D = \begin{bmatrix} -4 & 1 \\ 2 & 3 \end{bmatrix}$ $E = \begin{bmatrix} 2 & -5 \\ -3 & 1 \end{bmatrix}$

1. $A - C$

2. $D + E$

3. $-2B$

4. $D - B$

5. $3C + A$

6. BA

7. AB

8. ED

9. Find $det\ D$

10. Find E^{-1}

Task 4:

Harry is planning a family reunion for a total of 266 people, and he needs to figure out how many tables to buy. Adult sized tables can seat 8 people, and child sized tables can seat 6 people. The number of adult sized tables needed is 4 times the number of child sized tables.

A. Write a linear system of equations to represent this situation.

B. Create a matrix equation to represent this situation.

C. Use a graphing calculator to solve the matrix equation.

D. Interpret the solutions in the context of this problem. (use complete sentences)