Pre Calculus   Name_____

Matrix Test Review *calculator ok for 7,8 and 9 only*   Date_____ Period____

Simplify. Write "undefined" for expressions that are undefined.

1) $\begin{bmatrix} 2 & 3 \\ 3 & -3 \end{bmatrix} + \begin{bmatrix} 4 & 5 & 3 \\ 2 & 3 & -3 \end{bmatrix} \cdot \begin{bmatrix} -5 & -5 \\ -2 & -5 \\ -1 & 1 \end{bmatrix}$

2) $\begin{bmatrix} -3 & -4 & -6 \\ 1 & -2 & 6 \end{bmatrix} + \begin{bmatrix} 0 & -5 & 1 \\ -1 & -4 & -6 \end{bmatrix} \cdot \begin{bmatrix} 6 & -2 & -2 \\ -6 & -3 & -5 \end{bmatrix}$

3) $3r^2 \begin{bmatrix} -2r \\ 7 \\ -5 \end{bmatrix} - \begin{bmatrix} 3r \\ 11 \\ -2r^2 \end{bmatrix}$

-1-

Solve each equation or state if there is no unique solution.

4) $\begin{bmatrix} 2 & -11 \\ -1 & 4 \end{bmatrix} B + \begin{bmatrix} 8 & -3 \\ -9 & -2 \end{bmatrix} = \begin{bmatrix} 19 & 11 \\ -16 & -6 \end{bmatrix}$

5) Find the elements of C if: $A = \begin{bmatrix} -2 & 3 \\ 4 & -6 \end{bmatrix}$, $B = \begin{bmatrix} 1 & -8 \\ -2 & 4 \end{bmatrix}$ and $4A - 3B + 2C = \begin{bmatrix} 3 & 42 \\ 10 & -28 \end{bmatrix}$

Use a matrix equation to solve the system of equations.

6) $7x - 4y = -11$
   $-5x - 4y = 13$

7) A plane traveled 341.62 miles to Munich and back. The trip there was with the wind. It took 3.8 hours. The trip back was into the wind. The trip back took 6.2 hours. What is the speed of the plane in still air? What is the speed of the wind?

8) Mrs. B. invested $77,275; part at an interest rate of 6%, and part at an interest of 16%. The total interest collected on the investment was $7,934. How much did she invest at each rate?
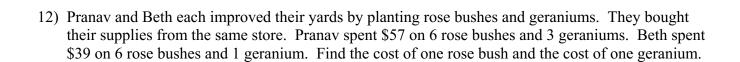
Find the area of a triangle with the given vertices.

9) $(2, -4.5), (1.5, 7),$ and $(-5, -2.5)$

If the following matrix does not have an inverse, find the value of _x_.

10) $\begin{bmatrix} -6 & x \\ 9 & 4 \end{bmatrix}$

11) Samantha has 51 coins, consisting of quarters, dimes, and nickels which total $6.75. There are three times as many nickels than dimes. How many of each does she have? Solve by hand.

12) Pranav and Beth each improved their yards by planting rose bushes and geraniums. They bought their supplies from the same store. Pranav spent $57 on 6 rose bushes and 3 geraniums. Beth spent $39 on 6 rose bushes and 1 geranium. Find the cost of one rose bush and the cost of one geranium.

Find the inverse of each matrix.

13) $\begin{bmatrix} -7 & -4 \\ -10 & 1 \end{bmatrix}$

14) $\begin{bmatrix} 2 & -14 \\ 1 & -7 \end{bmatrix}$

Solve each system by row reduction.

15) $2x - 5y + 4z = -16$
$-5x + 5y - 4z = 22$
$-2x + 5y - 2z = 20$

16) $-3x + 2z = -22$
   $-2x - 5y - 5z = 1$
   $5x + 5y + 3z = 14$

Answers to Matrix Test Review *calculator ok for 7,8 and 9 only*

1) $\begin{bmatrix} -31 & -39 \\ -10 & -31 \end{bmatrix}$

2) Undefined

3) $\begin{bmatrix} -6r^3 - 3r \\ 21r^2 - 11 \\ -13r^2 \end{bmatrix}$

4) $\begin{bmatrix} 11 & -4 \\ 1 & -2 \end{bmatrix}$

5) $\begin{bmatrix} 7 & 3 \\ -6 & 4 \end{bmatrix}$

6) $\left(-2, -\dfrac{3}{4}\right)$

7) plane: 72.5 mph, wind: 17.4 mph

8) $44,300 at 6% and $32,975 at 16%

9) 39.75 square units

10) $x = -\dfrac{8}{3}$

11) 19 Q and 8 D and 24 N

12) rose bush: $5, geranium: $9

13) $-\dfrac{1}{47} \cdot \begin{bmatrix} 1 & 4 \\ 10 & -7 \end{bmatrix}$

14) No inverse exists

15) $(-2, 4, 2)$

16) No solution

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-2-

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No solution

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 M a d e   w i t h   I n f i n i t e   A l g e b r a   2 .