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**Algebra 2**  
**Unit 4 Test Review**

1.  $\begin{bmatrix} \$40 & \$13 \\ \$18 & \$14 \\ \$30 & \$12 \end{bmatrix}$  What are the dimensions of this matrix?  
 $3 \times 2$

2. What are the dimensions of the matrix  $\begin{bmatrix} 1 \\ 2 \\ 3 \end{bmatrix}$ ?  
 $3 \times 1$

3. How many elements are there in a  $2 \times 3$  matrix?  
 $6$

For problems 4 – 6, use the following matrices.  $A = \begin{bmatrix} 2 & 3 & -1 \\ 0 & 7 & 1 \end{bmatrix}$  and  $B = \begin{bmatrix} -1 & 3 & 9 \\ 6 & 2 & -4 \end{bmatrix}$

4. Find  $A + B$   
 $\begin{bmatrix} 1 & 6 & 8 \\ 6 & 9 & -3 \end{bmatrix}$

5. Find  $B - A$   
 $\begin{bmatrix} -3 & 0 & 10 \\ 6 & -5 & -5 \end{bmatrix}$

6. Find  $AB$   
Undefined

7. Find  $\det \begin{bmatrix} 1 & 2 \\ 9 & 0 \end{bmatrix}$ .  
~~18~~  $-18$

8.  $Q = \begin{bmatrix} 0 & 4 \\ 2 & 1 \end{bmatrix}$  and  $R = \begin{bmatrix} 2 & -1 & 1 \\ 2 & -2 & 8 \end{bmatrix}$  Find  $QR$ .  
 $\begin{bmatrix} 8 & -8 & 32 \\ 6 & -4 & 10 \end{bmatrix}$

9. Solve the matrix equation for  $x$ .  $\begin{bmatrix} 1 & x \\ y & 7 \end{bmatrix} = \begin{bmatrix} 5 & 1 \\ 6 & z \end{bmatrix}$

$$x = 1$$

10. Solve the matrix equation in #9 for  $y$ .

$$y = 6$$

11. If  $A \cdot B = \begin{bmatrix} 3 & 2 & 9 & 7 \\ 5 & 1 & 0 & 6 \end{bmatrix}$  and  $A$  is a  $2 \times 3$  matrix, what are the dimensions of  $B$ ?

$$2 \times 3 \quad \boxed{3 \times 4}$$

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12. Evaluate  $\begin{bmatrix} 2 & -1 \\ 9 & 2 \end{bmatrix} \begin{bmatrix} 2 \\ 1 \end{bmatrix}$

$$\begin{bmatrix} 3 \\ 20 \end{bmatrix}$$

13. Find the determinant of  $\begin{bmatrix} -1 & 2 \\ -3 & -4 \end{bmatrix}$

$$10$$

14. Let  $A = \begin{bmatrix} 1 & 3 \\ 5 & 7 \end{bmatrix}$ . Which of the following is  $A^{-1}$ ?

$$\frac{1}{-8} \begin{bmatrix} 7 & -3 \\ 5 & 1 \end{bmatrix} = \begin{bmatrix} -7/8 & 3/8 \\ 5/8 & -1/8 \end{bmatrix}$$

15. Find the inverse of  $A = \begin{bmatrix} -2 & 1 \\ -2 & -1 \end{bmatrix}$

$$\frac{1}{4} \begin{bmatrix} -1 & -1 \\ 2 & -2 \end{bmatrix} = \begin{bmatrix} -1/4 & -1/4 \\ 1/2 & -1/2 \end{bmatrix}$$

16. Find the inverse of the following matrix  $\begin{bmatrix} 2 & -5 \\ 1 & 1 \end{bmatrix}$

$$\frac{1}{7} \begin{bmatrix} 1 & 5 \\ -1 & 2 \end{bmatrix} = \begin{bmatrix} 1/7 & 5/7 \\ -1/7 & 2/7 \end{bmatrix}$$

17. What is the solution to the system

$$2x + 5y = 6$$

$$10x - 10y = 30$$

$$(3, 0)$$

18. Identify the 2 x 2 and 3 x 3 identity matrix.

$$\begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$$

$$\begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{bmatrix}$$

19. Solve the following system of equations

$$4a + 5b + 5c = -19$$

$$3a + 2b - 4c = -4$$

$$-5a - 2b - c = 26$$

$$(-6, 3, -2)$$

20. Solve the following system of equations

$$-3x - 5y - z = 7$$

$$5x + 4y + 2z = -5$$

$$-3x - y - 2z = 5$$

$$(3, -2, -6)$$