Algebra 2B **Name** _____
M.1 **Assignment**

State the dimensions of each matrix.

1. $\begin{bmatrix} 3 & 2 & 4 \\ -1 & 4 & 0 \end{bmatrix}$

2. $\begin{bmatrix} 3 & 2 \\ 1 & 8 \end{bmatrix}$

3. $\begin{bmatrix} 6 & 1 & 2 \\ -3 & 4 & 5 \\ -2 & 7 & 9 \end{bmatrix}$

Solve each equation.

4. $\begin{bmatrix} 5x & 3y \end{bmatrix} = \begin{bmatrix} 15 & 12 \end{bmatrix}$

5. $\begin{bmatrix} 7x \\ 14 \end{bmatrix} = \begin{bmatrix} -14 \\ 2y \end{bmatrix}$

6. $\begin{bmatrix} 4x-1 \\ 9y+5 \end{bmatrix} = \begin{bmatrix} 3x \\ y-3 \end{bmatrix}$

7. $\begin{bmatrix} 5x \\ 4y-3 \\ 8z \end{bmatrix} = \begin{bmatrix} 4x+1 \\ 13 \\ 4z \end{bmatrix}$

Algebra 2B **Name** _____
M.2 **Assignment**

Perform the indicated matrix operations. If the matrix does not exist, write *impossible*.

1. $\begin{bmatrix}5 & -4\end{bmatrix}+\begin{bmatrix}4 & 5\end{bmatrix}$

2. $\begin{bmatrix}3 & 1 & 6\end{bmatrix}+\begin{bmatrix}4\\-1\\2\end{bmatrix}$

3. $3\begin{bmatrix}9 & 4 & -3\end{bmatrix}$

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

5. $3\begin{bmatrix}8\\0\\-3\end{bmatrix}-4\begin{bmatrix}2\\2\\10\end{bmatrix}$

6. $5\begin{bmatrix}-4 & 6\\10 & 1\\-1 & 1\end{bmatrix}+2\begin{bmatrix}6 & 5\\-3 & -2\\1 & 0\end{bmatrix}$

Use $A = \begin{bmatrix} 3 & 2 \\ 4 & 3 \end{bmatrix}$, $B = \begin{bmatrix} 2 & 2 \\ 1 & -2 \end{bmatrix}$, **and** $C = \begin{bmatrix} -3 & 4 \\ 3 & 1 \end{bmatrix}$ **to find the following.**

7. $A + B$

8. $A + B + C$

9. $-5C$

10. $A - 4C$

Algebra 2B **Name** _____
M.3 **Assignment**

Determine whether each matrix product is defined. If so, state the dimensions of the product.

1. $A_{2\times 5}\cdot B_{5\times 1}$

2. $B_{3\times 2}\cdot A_{3\times 2}$

3. $R_{4\times 4}\cdot S_{4\times 1}$

4. $A_{6\times 4}\cdot B_{4\times 5}$

Find each product, if possible.

5. $\begin{bmatrix}3 & 2\end{bmatrix}\cdot\begin{bmatrix}2\\1\end{bmatrix}$

6. $\begin{bmatrix}5 & 6\\2 & 1\end{bmatrix}\cdot\begin{bmatrix}2 & -5\\3 & 1\end{bmatrix}$

7. $\begin{bmatrix}1 & 3\\-1 & 1\end{bmatrix}\cdot\begin{bmatrix}3\\-2\end{bmatrix}$

8. $\begin{bmatrix}3\\-2\end{bmatrix}\cdot\begin{bmatrix}1 & 3\\-1 & 1\end{bmatrix}$

9. $\begin{bmatrix}-1\\3\end{bmatrix}\cdot\begin{bmatrix}2 & -3 & -2\end{bmatrix}$

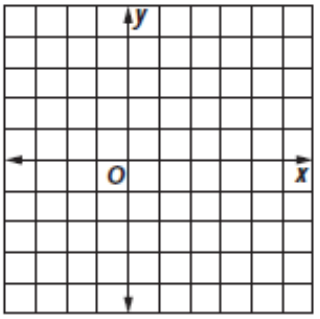
10. $\begin{bmatrix}0 & 1 & 1\\1 & 1 & 0\end{bmatrix}\cdot\begin{bmatrix}2\\2\\2\end{bmatrix}$

Use $A = \begin{bmatrix} 2 & 1 \\ 2 & 1 \end{bmatrix}$, $B = \begin{bmatrix} -3 & 2 \\ 5 & 1 \end{bmatrix}$, $C = \begin{bmatrix} 3 & -1 \\ 1 & 0 \end{bmatrix}$**, and scalar *c* = 2 to determine whether the following equations are true for the given matrices.**

11. $AB = BA$

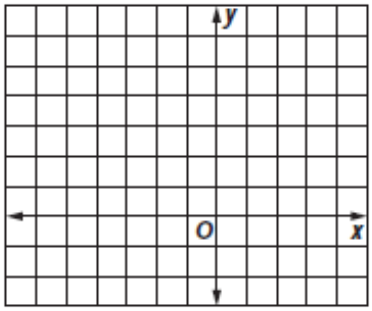
Algebra 2B **Name** _____
M.4 **Assignment**

For Exercises 1–3, use the following information.
Triangle ABC with vertices $A(2, 3)$, $B(0, 4)$, and $C(-3, -3)$ is translated 3 units right and 1 unit down.



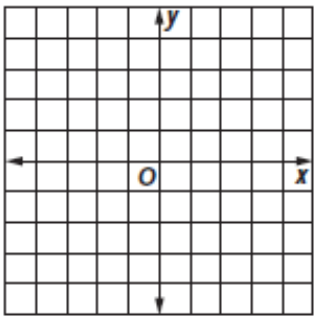
1. Write the translation matrix.
2. Find the coordinates of $\triangle A'B'C'$.
3. Graph the preimage and the image.

For Exercises 4–6, use the following information.
The vertices of $\triangle RST$ are $R(-3, 1)$, $S(2, -1)$, and $T(1, 3)$. The triangle is dilated so that its perimeter is twice the original perimeter.



4. Write the coordinates of $\triangle RST$ in a vertex matrix.
5. Find the coordinates of the image $\triangle R'S'T'$.
6. Graph $\triangle RST$ and $\triangle R'S'T'$.

For Exercises 7–10, use the following information.
The vertices of quadrilateral $ABCD$ are $A(-3, 2)$, $B(0, 3)$, $C(4, -4)$, and $D(-2, -2)$. The quadrilateral is reflected over the y-axis.



7. Write the coordinates of $ABCD$ in a vertex matrix.
8. Write the reflection matrix for this situation.
9. Find the coordinates of $A'B'C'D'$.
10. Graph $ABCD$ and $A'B'C'D'$.

Algebra 2B **Name** _____
M.5 **Assignment**

Find the value of each determinant.

1. $\begin{vmatrix} 5 & 2 \\ 1 & 3 \end{vmatrix}$

2. $\begin{vmatrix} 2 & 5 \\ 3 & 1 \end{vmatrix}$

3. $\begin{vmatrix} 3 & 12 \\ 2 & 8 \end{vmatrix}$

4. $\begin{vmatrix} -5 & 2 \\ 8 & -6 \end{vmatrix}$

5. $\begin{vmatrix} 1 & -5 \\ 1 & 6 \end{vmatrix}$

6. $\begin{vmatrix} -1 & -3 \\ 5 & -2 \end{vmatrix}$

7. $\begin{vmatrix} 2 & 2 \\ -1 & 4 \end{vmatrix}$

8. $\begin{vmatrix} -1 & 6 \\ 2 & 5 \end{vmatrix}$

Evaluate each determinant using a calculator.

9. $\begin{vmatrix} 2 & -1 & 1 \\ 3 & 2 & -1 \\ 2 & 3 & -2 \end{vmatrix}$

10. $\begin{vmatrix} 6 & -1 & 1 \\ 5 & 2 & -1 \\ 1 & 3 & -2 \end{vmatrix}$

11. $\begin{vmatrix} 2 & 6 & 1 \\ 3 & 5 & -1 \\ 2 & 1 & -2 \end{vmatrix}$

Algebra 2B **Name** _____
M.6 **Assignment**

Determine whether each pair of matrices are inverses.

1. $X = \begin{bmatrix} 1 & 0 \\ 1 & 1 \end{bmatrix}$, $Y = \begin{bmatrix} 1 & 0 \\ -1 & 1 \end{bmatrix}$

2. $X = \begin{bmatrix} -3 & 2 \\ 5 & -3 \end{bmatrix}$, $Y = \begin{bmatrix} 3 & 2 \\ 5 & 3 \end{bmatrix}$

3. $M = \begin{bmatrix} -1 & 0 \\ 0 & 3 \end{bmatrix}$, $N = \begin{bmatrix} -1 & 0 \\ 0 & -3 \end{bmatrix}$

4. $V = \begin{bmatrix} 0 & 7 \\ -7 & 0 \end{bmatrix}$, $W = \begin{bmatrix} 0 & -\frac{1}{7} \\ \frac{1}{7} & 0 \end{bmatrix}$

Find the inverse of each matrix, if it exists.

5. $\begin{bmatrix} 0 & 2 \\ 4 & 0 \end{bmatrix}$

6. $\begin{bmatrix} 1 & 1 \\ 3 & 2 \end{bmatrix}$

7. $\begin{bmatrix} 1 & -1 \\ 3 & 3 \end{bmatrix}$

8. $\begin{bmatrix} 3 & 6 \\ -1 & -2 \end{bmatrix}$

Algebra 2B **Name** _____
M.7 **Assignment**

Write a matrix equation for each system of equations.

1. $3a + 8b = 16$
   $4a + 3b = 3$

2. $m + 3n = -3$
   $4m + 3n = 6$

3. $6x - y + 2z = -4$
   $-3x + 2y - z = 10$
   $x + y + z = 3$

4. $a - b + c = 5$
   $3a + 2b - c = 0$
   $2a + 3b = 8$

Solve each matrix equation or system of equations by using inverse matrices.

5. $\begin{bmatrix} 1 & 3 \\ 4 & 3 \end{bmatrix} \cdot \begin{bmatrix} w \\ z \end{bmatrix} = \begin{bmatrix} -7 \\ -1 \end{bmatrix}$

6. $\begin{bmatrix} 4 & 3 \\ 1 & 3 \end{bmatrix} \cdot \begin{bmatrix} x \\ y \end{bmatrix} = \begin{bmatrix} 6 \\ -3 \end{bmatrix}$

7. $\begin{bmatrix} 5 & 8 \\ 3 & 1 \end{bmatrix} \cdot \begin{bmatrix} a \\ b \end{bmatrix} = \begin{bmatrix} -1 \\ 7 \end{bmatrix}$

8. $\begin{bmatrix} 7 & -3 \\ 5 & 4 \end{bmatrix} \cdot \begin{bmatrix} m \\ n \end{bmatrix} = \begin{bmatrix} 15 \\ 23 \end{bmatrix}$

9. $2m + 2n = -8$
   $6m + 4n = -18$

10. $-3a + b = -9$
    $5a - 2b = 14$