MATRICES: Dimensions & Solving Matrix Equations NAME answer key

#1-4. Identify the dimensions of each of the following matrices.

1. $A = \begin{bmatrix} 2 & -3 & 0 \end{bmatrix}$ 1x3

2. $B = \begin{bmatrix} 2 & 5 & -1 \\ -3 & 0 & 6 \\ 7 & 1 & -2 \end{bmatrix}$ 3x3

3. $C = \begin{bmatrix} 9 & 6 & -3 \\ 1 & -5 & 4 \end{bmatrix}$ 2x3

4. $D = \begin{bmatrix} -3 & .5 & 6 \\ 1 & -2 & 4 \\ \frac{2}{3} & 5 & 0 \\ -4 & 3 & 2 \end{bmatrix}$ 4x3

#5-8. Using the matrices above, identify each of the following.

5. The element in row 3, column 2 of matrix B 1

6. The element in row 1, column 3 of matrix A 0

7. The element in row 1, column 2 of matrix C 6

8. The element in row 3, column 1 of matrix D 2/3

#9-12. Solve each matrix equation for the variables.

9. $\begin{bmatrix} 10 & -3y \\ 6 & 13 \end{bmatrix} = \begin{bmatrix} 10 & -15 \\ 6x & 13 \end{bmatrix}$ x = 1 y = 5

10. $\begin{bmatrix} \frac{2}{3}x & -18 \\ \frac{z}{2} & 1 \end{bmatrix} = \begin{bmatrix} 12 & y-7 \\ 5 & 1 \end{bmatrix}$

$\frac{2}{3}x = 12$

$2x = 36$

$x = 18$

$y - 7 = -18$

$y = -11$

x = 18 y = -11 z = 10

11. $\begin{bmatrix} 2x-3 & \frac{1}{2}y+2 \\ 23 & 4z-1 \end{bmatrix} = \begin{bmatrix} 5x+1 & 3 \\ 8-5w & 5+6z \end{bmatrix}$

$2x-3 = 5x+1$

$-4 = 3x$

$x = -4/3$

$\frac{1}{2}y + 2 = 3$

$\frac{1}{2}y = 1$

$y = 2$

$8 - 5w = 23$

$-5w = -15$

$w = 3$

$4z - 1 = 5 + 6z$

$-6 = 2z$

$z = -3$

12. $\begin{bmatrix} 4x & 5-3y \\ -6 & z+3 \\ 8 & 2 \end{bmatrix} = \begin{bmatrix} x-2 & -10 \\ 3a & \frac{1}{2}z \\ 2a+3b & 2 \end{bmatrix}$

$4x = x - 2$

$3x = -2$

$x = -2/3$

$5 - 3y = -10$

$-3y = -15$

$y = 5$

$z + 3 = \frac{1}{2}z$

$\frac{1}{2}z = -3$

$z = -6$

$3a = -6$

$a = -2$

$2a + 3b = 8$

$-4 + 3b = 8$

$3b = 12$

$b = 4$