

Precalculus 9.3 Homework

Name _____ period _____ date _____

Use the following matrices to evaluate the given expressions.

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

1. $A+B$

2. $-5B$

3. $3A-2B$

4. AC

5. CA

6. $CA+5I_3$

7. CB

8. $CA-CB$

Multiply.

$$9. \begin{bmatrix} 4 & 1 \\ 2 & 1 \end{bmatrix} \begin{bmatrix} -6 & 6 & 1 & 0 \\ 2 & 5 & 4 & -1 \end{bmatrix}$$

$$10. \begin{bmatrix} 1 & 0 & 1 \\ 2 & 4 & 1 \\ 3 & 6 & 1 \end{bmatrix} \begin{bmatrix} 1 & 3 \\ 6 & 2 \\ 8 & -1 \end{bmatrix}$$

Find the inverse of each matrix by hand. Show your work!

$$11. \begin{bmatrix} 2 & 1 \\ 1 & 1 \end{bmatrix}$$

$$12. \begin{bmatrix} 6 & 5 \\ 2 & 2 \end{bmatrix}$$

$$13. \begin{bmatrix} 2 & 1 \\ a & a \end{bmatrix}$$

$$14. \begin{bmatrix} 1 & -1 & 1 \\ 0 & -2 & 1 \\ -2 & -3 & 0 \end{bmatrix}$$

Use the inverses found in problems 11-14 to solve each system of equations.

$$15. \begin{cases} 2x + y = 8 \\ x + y = 5 \end{cases}$$

$$16. \begin{cases} 2x + y = 0 \\ x + y = 5 \end{cases}$$

$$17. \begin{cases} 6x + 5y = 7 \\ 2x + 2y = 2 \end{cases}$$

$$18. \begin{cases} 2x + y = \frac{7}{a} \\ ax + ay = 5 \end{cases}$$

$$19. \begin{cases} x - y + z = 0 \\ -2y + z = -1 \\ -2x - 3y = -5 \end{cases}$$

$$20. \begin{cases} x - y + z = 2 \\ -2y + z = 2 \\ -2x - 3y = 1/2 \end{cases}$$

Show that each matrix is singular (has no inverse).

$$21. \begin{bmatrix} -3 & \frac{1}{2} \\ 6 & -1 \end{bmatrix}$$

$$22. \begin{bmatrix} 15 & 3 \\ 10 & 2 \end{bmatrix}$$