

PreCalculus
Review #1 Matrices

Name _____

Name each matrix.

1. $R = \begin{bmatrix} 7 \\ 1 \\ -6 \end{bmatrix}$

2. $S = \begin{bmatrix} -1 & 3 & 0 & 8 \\ 4 & -2 & 10 & -5 \end{bmatrix}$

1. _____

2. _____

3. _____

Solve each equation.

3. $\begin{bmatrix} -10 & y \\ x & 10 \end{bmatrix} = -2 \begin{bmatrix} 5 & -2 \\ 6 & z \end{bmatrix}$

4. $\begin{bmatrix} 2x \\ 3y \end{bmatrix} + 3 \begin{bmatrix} y-1 \\ x+2 \end{bmatrix} = \begin{bmatrix} -7 \\ 3 \end{bmatrix}$

4. _____

Perform the indicated operations.

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

6. $\begin{bmatrix} 5 \\ 2 \\ 4 \\ -3 \end{bmatrix} \cdot [-1 \ 3 \ 5]$

5. _____

6. _____

7. $\begin{bmatrix} 1 & 5 \\ 2 & 0 \\ 3 & 6 \end{bmatrix} + \begin{bmatrix} -1 & 4 \\ 0 & -3 \\ 6 & 8 \end{bmatrix}$

8. $\begin{bmatrix} 6 & 8 & 3 \\ 5 & 2 & -9 \end{bmatrix} - \frac{1}{2} \begin{bmatrix} 4 & 16 & 8 \\ 0 & 6 & 2 \end{bmatrix}$

7. _____

8. _____

9. $\begin{bmatrix} 8 & 9 \\ -2 & 1 \\ 0 & 8 \end{bmatrix} \cdot \begin{bmatrix} -6 \\ 5 \end{bmatrix}$

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

9. _____

11. Find the inverse of $\begin{bmatrix} 10 & 0 \\ 5 & 4 \end{bmatrix}$

10. _____

12. What is the 5×5 identity matrix?

11. _____

13. Find the area of a Δ with vertices $(8,0)$, $(5,6)$, and $(-2,10)$.

12. _____

14. What is the value of $\begin{vmatrix} 1 & 8 & -2 \\ 3 & -1 & 4 \\ 2 & -3 & -1 \end{vmatrix}$? 14. _____

- A. 43 B. 115 C. 51 D. 123

15. Find the value of x for which the equation is true. $\begin{bmatrix} 3x \\ y \end{bmatrix} = \begin{bmatrix} 10 + 2y \\ 5 - x \end{bmatrix}$ 15. _____

- A. 20 B. 25 C. 1 D. 4

16. If the system $\begin{cases} 3x = 5y + 2 \\ y = 15 - 6x \end{cases}$ is written as a matrix equation, by which matrix would you multiply both sides to obtain the solution?

A. $\begin{bmatrix} \frac{3}{40} & -\frac{1}{40} \\ \frac{8}{1} & \frac{3}{3} \end{bmatrix}$ B. $\begin{bmatrix} \frac{3}{8} & -\frac{1}{8} \\ -\frac{1}{16} & \frac{3}{16} \end{bmatrix}$ C. $\begin{bmatrix} -\frac{1}{27} & -\frac{5}{27} \\ \frac{2}{9} & -\frac{1}{9} \end{bmatrix}$ D. $\begin{bmatrix} \frac{1}{33} & \frac{5}{33} \\ \frac{2}{11} & \frac{1}{11} \end{bmatrix}$ 16. _____

17. If $M_{1 \times 4}$ is multiplied by $N_{4 \times 1}$, what are the dimensions of the product?

- A. 4×4 B. 1×4 C. 1×1 D. 4×1 17. _____

18. Write as a matrix equation, then solve using the inverse. $\begin{cases} x - 3y = 15 \\ x - 4y = -13 \end{cases}$

18. _____

19. Solve using cramer's rule. $\begin{cases} 2x - 3y - 4z = -20 \\ 3x - 4y - z = 2 \\ x - 4y - z = -6 \end{cases}$

19. _____

20. If $A_{2 \times 4} \cdot B_{4 \times 1}$ what are the dimensions of the product? 20. _____

21. If $A_{2 \times 6} \cdot B = C_{2 \times 5}$, what are the dimensions of B? 21. _____

22. If $D \cdot E_{7 \times 1} = G_{1 \times 1}$, what are the dimensions of D? 22. _____

23. What is the product of a matrix and its inverse? 23. _____

24. What is the 4x4 identity matrix? 24. _____

25. If matrix $B = \begin{bmatrix} -2 & 1 & -3 \\ 4 & -2 & 5 \\ 3 & -1 & 2 \end{bmatrix}$, then $\det B =$ _____. 25. _____

Answers to Review #1

Matrices

1. $R_{3 \times 1}$

2. $S_{2 \times 4}$

3. $x = -12, y = 4, z = -5$

4. $x = 1, y = -2$

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

6. $\begin{bmatrix} -5 & 15 & 25 \\ -2 & 6 & 10 \\ -4 & 12 & 20 \\ 3 & -9 & -15 \end{bmatrix}$

7. $\begin{bmatrix} 0 & 9 \\ 2 & -3 \\ 9 & 14 \end{bmatrix}$

8. $\begin{bmatrix} 4 & 0 & -1 \\ 5 & -1 & -10 \end{bmatrix}$

9. $\begin{bmatrix} -3 \\ 17 \\ 40 \end{bmatrix}$

10. 163

11. $\begin{bmatrix} \frac{1}{10} & 0 \\ -\frac{1}{8} & \frac{1}{4} \end{bmatrix}$

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

13. $15u^2$

14. B

15. D

16. D

17. C

18. $\begin{bmatrix} 99 \\ 28 \end{bmatrix}$

19. $x = 4, y = \frac{12}{13}, z = \frac{82}{13}$

20. 2×1

21. 6×5

22. 1×7

23. I

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

25. -1