PreCalculus

Review 2 unit 4 Matrices Name_____

1. What are the dimensions of :

a) $\begin{bmatrix} 2 & 0 \\ -1 & 1 \\ 6 & 5 \end{bmatrix}$ b) $\begin{bmatrix} 2 \\ 5 \end{bmatrix}$ c) $\begin{bmatrix} -1 & 5 & 90 & 4 \end{bmatrix}$ d) $\begin{bmatrix} 1 & 0 & -3 & 6 & -8 \\ -7 & 5 & 2 & 0 & 4 \end{bmatrix}$

2. $2\begin{bmatrix} -1 & 4 \\ 3 & 0 \end{bmatrix} + 3\begin{bmatrix} -2 & 9 \\ 1 & 8 \end{bmatrix}$

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

4. Find $A^{-1}$ if $A = \begin{bmatrix} -1 & 2 \\ 3 & 4 \end{bmatrix}$

5. Solve: $\begin{bmatrix} 8 & -11 & 0 \\ -7 & 6 & 2 \end{bmatrix} - X = \begin{bmatrix} 6 & -4 & 2 \\ 3 & 0 & 5 \end{bmatrix}$

6. Solve: $5X - 3\begin{bmatrix} 0 & -2 \\ 1 & 2 \\ -4 & 7 \end{bmatrix} = 2\begin{bmatrix} 5 & -7 \\ 1 & -3 \\ -9 & 2 \end{bmatrix}$

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

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

9. Solve: $\begin{bmatrix} 3 & 4 \\ 2 & 3 \end{bmatrix}X = \begin{bmatrix} 2 & 1 \\ 5 & 3 \end{bmatrix}$

10. Solve for w, x, y:

$$\begin{bmatrix} w & y & x \end{bmatrix} - \begin{bmatrix} x & -w & y \end{bmatrix} = \begin{bmatrix} 1 & -1 & -4 \end{bmatrix}$$

11. Solve using augmented matrices without a calculator.(separate sheet)

a) $\begin{aligned} 7x - 11y &= 10 \\ 3x + 2y &= 58 \end{aligned}$

b) $\begin{aligned} x - 2y + 3z &= -2 \\ -4x + 10y + 2z &= -2 \\ 3x + y + 10z &= 7 \end{aligned}$

12. Solve using matrix equations:

$$5x - 2y = -11$$
$$2x + 4y = 10$$

13. Solve using cramer's rule.

$$4x - 12y = 7$$
$$x + 6y = 9$$

14. What is $I_{2x2}$?

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

a) $2B + A$ b) $4B - A$ c) $A^{-1}$ d) $B^2$

16. If $C \bullet H_{6x1} = E_{2x1}$ , what are the dimensions of $C$?

17. Give an example of a matrix whose determinant is zero.

18. What is $B_{2x2} \bullet B^{-1}{}_{2x2}$ = _____.

19. Suppose $D_{exf}$ and $G_{jxb}$. If $D + G$ exists, then $e$ = ___, and $f$ = _____

20. If $A = \begin{bmatrix} 6 & -1 & 0 & 3 \\ -4 & 5 & 7 & -2 \end{bmatrix}$. What is $A_{23}$?

21. Solve using a calculator.
$$-2w + x + y = -2$$
$$-w + 2x - y + z = -4$$
$$-2w + 3x + 3y + 2z = 2$$
$$w + x + 2y + z = 6$$

22. What is $I_{4x4}$?

Answers to Review #2
Matrices

1.a) 3 x 2 b) 2 x 1 c) 1 x 4 d) 2 x 5 2. $\begin{bmatrix} -8 & 35 \\ 9 & 24 \end{bmatrix}$

3. $\begin{bmatrix} 10 \\ -32 \end{bmatrix}$ 4. $\begin{bmatrix} -\frac{2}{5} & \frac{1}{5} \\ \frac{3}{10} & \frac{1}{10} \end{bmatrix}$ 5. $X = \begin{bmatrix} 2 & -7 & -2 \\ -10 & 6 & -3 \end{bmatrix}$

6. $X = \begin{bmatrix} 2 & -4 \\ 1 & 0 \\ -6 & 5 \end{bmatrix}$ 7. Undefined (not possible) 8. $\begin{bmatrix} 20 & -40 \\ -6 & 15 \\ -7 & 20 \end{bmatrix}$

9. $X = \begin{bmatrix} -14 & -9 \\ 11 & 7 \end{bmatrix}$ 10. w = -2, x = -3, y = 1 11. a) $\left[\begin{array}{cc|c} 1 & 0 & 14 \\ 0 & 1 & 8 \end{array}\right]$

11.b) $\left[\begin{array}{ccc|c} 1 & 0 & 0 & 5 \\ 0 & 1 & 0 & 2 \\ 0 & 0 & 1 & -1 \end{array}\right]$ 12. $\begin{bmatrix} x \\ y \end{bmatrix} = \begin{bmatrix} -1 \\ 3 \end{bmatrix}$ 13. $x = \frac{25}{6}$, $y = \frac{29}{36}$

14. $\begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$ 15. a) $\begin{bmatrix} -4 & 11 \\ 13 & -6 \end{bmatrix}$ b) $\begin{bmatrix} -2 & 1 \\ 17 & -12 \end{bmatrix}$ c) $\begin{bmatrix} 0 & \frac{1}{3} \\ \frac{1}{7} & \frac{2}{21} \end{bmatrix}$ d) $\begin{bmatrix} 11 & -8 \\ -20 & 19 \end{bmatrix}$

16. 2 x 6 17. answers will vary ex. $\begin{bmatrix} 4 & 2 \\ 6 & 3 \end{bmatrix}$ 18. $\begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$

19. e = j and f = b 20. 7 21. $\begin{bmatrix} w \\ x \\ y \\ z \end{bmatrix} = \begin{bmatrix} 2 \\ 0 \\ 2 \\ 0 \end{bmatrix}$ 22. $\begin{bmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix}$