Name: _____ Per: _____ Date: _____

Algebra II – Chapter 4 Test Review

Please do all work on separate paper. Reviews are due on test day – no late reviews accepted!
You may use a graphing calculator ONLY for problems with an asterisk (*)

Without graphing, classify each system as *independent, dependent,* or *inconsistent* *(example 3 p.122)*.

1. $\begin{cases} -2x - y = 9 \\ 3x - 4y = -8 \end{cases}$

2. $\begin{cases} y = 4x + 6 \\ -8x + 2y = 12 \end{cases}$

Solve the system by the method of substitution *(example 1, p. 127)*.

*3. $\begin{cases} 3x + y = -3 \\ y = x + 5 \end{cases}$

*4. $\begin{cases} 5x - y = 5 \\ 5x - 3y = 15 \end{cases}$

Use the elimination method to solve the system *(example 3, p.128)*.

*5. $\begin{cases} 5x + 3y = 12 \\ 6x - 4y = -16 \end{cases}$

*6. $\begin{cases} -x + 2y = 10 \\ -3x + 6y = 11 \end{cases}$

Write the dimensions of each matrix. Identify the indicated element *(example 1 & 2, p. 172)*.

*7. $\begin{bmatrix} 2 & -3 \\ 5 & 1 \\ -7 & 4 \end{bmatrix}; a_{21}$

*8. $\begin{bmatrix} 5 & -7 & 23 & 10 \\ -9 & 3 & 5 & -2 \\ 1 & 9 & 0 & 2 \end{bmatrix}; a_{23}$

Find the value of each variable *(example 6, p. 181)*.

*9. $\begin{bmatrix} a & 2b \\ c-2 & d+3 \end{bmatrix} = \begin{bmatrix} 5 & -7 \\ 10 & 10 \end{bmatrix}$

*10. $\begin{bmatrix} 3 & 5 & -y & x \\ z & 0 & 3a & 6 \end{bmatrix} = \begin{bmatrix} 3 & 3c & 7 & 4 \\ 8 & 0 & -9 & 3b \end{bmatrix}$

Solve each matrix equation *(example 4, p. 180)*.

*11. $X - 2\begin{bmatrix} 3 & 4 \\ 4 & 2 \\ 1 & 9 \end{bmatrix} = \begin{bmatrix} 5 & 7 \\ 9 & 12 \\ 3 & 2 \end{bmatrix}$

*12. $X + 3\begin{bmatrix} 2 & 2 & 0 \\ 1 & -1 & -1 \end{bmatrix} = \begin{bmatrix} 2 & -2 & 3 \\ -3 & -3 & 4 \end{bmatrix}$

Use matrices A, B, C to find each product, sum or difference if possible, If not write undefined *(example 3, p. 180)*

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

13. CA

14. A + B

15. 2A + 4C

State whether each product is possible.
If so, state the dimensions of the product, AND find the product *(example 4 & 6, p. 188)*

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

17. $\begin{bmatrix} 1 & 2 \\ 12 & 2 \end{bmatrix} \begin{bmatrix} 3 & 4 \\ 4 & 3 \\ 5 & 2 \end{bmatrix}$

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

Evaluate the determinant of each matrix.
(example 2, p. 204)

19. $\begin{bmatrix} -3 & 4 \\ 1 & -1 \end{bmatrix}$ 20. $\begin{bmatrix} 3 & 9 \\ 3 & 2 \end{bmatrix}$

Find the inverse matrix, if it exists.
(example 3, p. 205)

21. A = $\begin{bmatrix} 2 & -2 \\ -1 & 2 \end{bmatrix}$ 22. C = $\begin{bmatrix} 3 & 4 \\ 3 & 4 \end{bmatrix}$

Solve each equation using inverses.
(example 4, p. 206)

23. $\begin{bmatrix} 1 & 3 \\ 1 & 4 \end{bmatrix} X = \begin{bmatrix} 5 \\ 6 \end{bmatrix}$ 24. $\begin{bmatrix} 1 & 1 \\ 1 & -1 \end{bmatrix} X = \begin{bmatrix} 3 \\ -1 \end{bmatrix}$

Determine whether the matrices are multiplicative inverses.
(example 1, p. 204)

25. $\begin{bmatrix} 2 & 1 \\ 5 & 3 \end{bmatrix}, \begin{bmatrix} 3 & -1 \\ -5 & 2 \end{bmatrix}$ 26. $\begin{bmatrix} 4 & 9 \\ 2 & 6 \end{bmatrix}, \begin{bmatrix} 1 & \frac{-3}{2} \\ \frac{-1}{3} & \frac{2}{3} \end{bmatrix}$

Evaluate the determinant of each matrix.
(example 1, p. 210)

27. $\begin{bmatrix} -1 & 2 & -2 \\ 0 & 1 & 3 \\ 4 & 2 & -1 \end{bmatrix}$ 28. $\begin{bmatrix} 2 & 6 & -1 \\ 1 & 0 & 0 \\ 1 & 3 & -2 \end{bmatrix}$

Find the inverse matrix, if it exists.
(example 4, p. 212)

*29. $\begin{bmatrix} 1 & 2 & 0 \\ -2 & 0 & -3 \\ 3 & -1 & 5 \end{bmatrix}$ *30. $\begin{bmatrix} 1 & 1 & 1 \\ 2 & 1 & 0 \\ 0 & 2 & 3 \end{bmatrix}$

Solve each equation for X (use a graphing calculator) *(example 4, p. 212).*

*31. $\begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{bmatrix} X = \begin{bmatrix} 4 \\ -5 \\ 3 \end{bmatrix}$ *32. $\begin{bmatrix} 1 & 2 & 0 \\ -2 & 0 & -3 \\ 3 & -1 & 5 \end{bmatrix} X = \begin{bmatrix} -1 \\ 12 \\ -20 \end{bmatrix}$

Solve each system using inverse matrices (show your matrix equations!!!) *(example 2 & 3, p. 219).*

33. $\begin{cases} x + 3y = 5 \\ x + 4y = 6 \end{cases}$ 34. $\begin{cases} 2x + y = 1 \\ 3x - y = 9 \end{cases}$ *35. $\begin{cases} 2x + 2y + 5z = 16 \\ 4x - 2y + 3z = -2 \\ 8z - 5y - 2z = 4 \end{cases}$ *36. $\begin{cases} x + y + z = -1 \\ 3x + 5y + 4z = 2 \\ 3x + 6y + 5z = 0 \end{cases}$

Solve each system of equations by using Cramer's Rule *(example 1 & 2, p. 225)*

37. $\begin{cases} x + 3y = 5 \\ x + 4y = 6 \end{cases}$ 38. $\begin{cases} 2x + y = 1 \\ 3x - y = 9 \end{cases}$ 39. $\begin{cases} 2y - 2z = -2 \\ x + 4y + 2z = -25 \\ 2x - 4y + 4z = 10 \end{cases}$

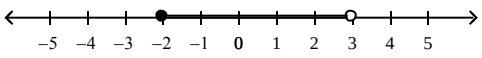
40. Solve the compound inequality $-13 \leq 5x - 3 < 12$ and graph the solution.

41. Graph the absolute value function $y = |x + 3| + 1$

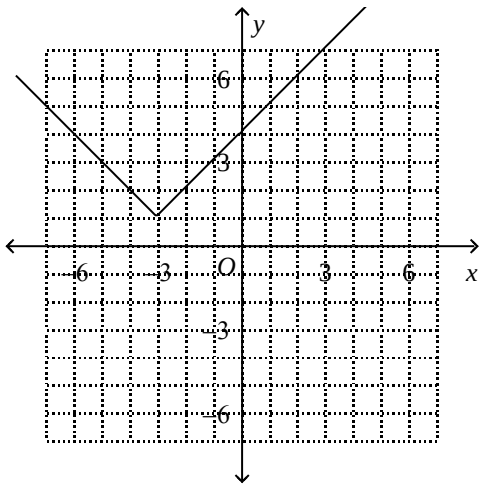
** problems with an asterisk are graphing calculator ALLOWED*

Algebra II 2nd Six Weeks Test Review

1. Independent
2. Dependent
3. x = -2, y = 3
4. x = 0, y = -5
5. x = 0, y = 4
6. no solutions
7. 3x2 matrix; $a_{21} = 5$
8. 3x4 matrix; $a_{23} = 5$
9. a = 5; b = -3.5; c = 12; d = 7
10. x = 4; y = -7; z = 8; a = -3; b = 2
11. $X = \begin{bmatrix} 11 & 15 \\ 17 & 16 \\ 5 & 20 \end{bmatrix}$
12. $X = \begin{bmatrix} -4 & -8 & 3 \\ -6 & 0 & 7 \end{bmatrix}$
13. $CA = \begin{bmatrix} 1 & -1 \\ 3 & -2 \end{bmatrix}$
14. Can't add – different dimensions
15. $2A + 4C = \begin{bmatrix} 6 & -2 \\ 6 & 0 \end{bmatrix}$
16. Yes, product will be a 3x4 matrix:
    $\begin{bmatrix} 1 & 2 & 3 & 4 \\ 2 & 4 & 6 & 8 \\ 3 & 6 & 9 & 12 \end{bmatrix}$
17. Not defined (2x**2** times a **3**x2)
18. Yes, product will be a 2x2 matrix: $\begin{bmatrix} 4 & 5 \\ 5 & 4 \end{bmatrix}$
19. -1
20. -21
21. Yes, the inverse exists… det A = 2,
    $A^{-1} = \begin{bmatrix} 1 & 1 \\ 1/2 & 1 \end{bmatrix}$
22. det C = 0… so no inverse exists.
23. $X = \begin{bmatrix} 2 \\ 1 \end{bmatrix}$
24. $X = \begin{bmatrix} 1 \\ 2 \end{bmatrix}$
25. Product = $\begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$, so yes, they are multiplicative inverses.
26. Product = $\begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$, so yes, they are multiplicative inverses.
27. 39
28. 9
29. The multiplicative inverse matrix is
    $\begin{bmatrix} 3 & 10 & 6 \\ -1 & -5 & -3 \\ -2 & -7 & -4 \end{bmatrix}$
30. The multiplicative inverse matrix is
    $\begin{bmatrix} 3 & -1 & -1 \\ -6 & 3 & 2 \\ 4 & -2 & -1 \end{bmatrix}$
31. $X = \begin{bmatrix} 4 \\ -5 \\ 3 \end{bmatrix}$
32. $X = \begin{bmatrix} -3 \\ 1 \\ -2 \end{bmatrix}$
33. x = 2, y = 1
34. x = 2, y = -3
35. x = 5, y = 8, z = -2
36. x = 1, y = 7, z = -9
37. x = 2, y = 1
38. x = 2, y = -3
39. x = 3, y = -5, z = -4
40. $-2 \leq x < 3$



41.



** problems with an asterisk are graphing calculator ALLOWED*