Name _____ Algebra 2

Chapter 4 Practice Test

No Calculator Section:

1. Solve the system using substitution:
$$x - 2y = -1$$
$$3x - 4y = 3$$

2. Solve the system using elimination.
$$3x + 4y = 2$$
$$5x - 3y = 13$$

3. Add or subtract the matrices, if possible.
   a. $\begin{bmatrix} 11 & 4 & -8 \\ 2 & -3 & 6 \end{bmatrix} + \begin{bmatrix} -1 & 5 & 12 \\ 20 & 18 & 4 \end{bmatrix}$

   b. $\begin{bmatrix} 48 & 15 \\ -6 & 24 \end{bmatrix} - \begin{bmatrix} 12 & -3 \\ -7 & 8 \end{bmatrix}$

   c. $\begin{bmatrix} 10 & -19 & 4 \end{bmatrix} + \begin{bmatrix} 23 & -3 & 16 \\ 54 & 13 & 5 \end{bmatrix}$

4. Multiply.
   a. $4\begin{bmatrix} 7 & -5 & 9 \end{bmatrix}$

   b. $-3\begin{bmatrix} 21 & 8 \\ -4 & 25 \end{bmatrix}$

   c. $\frac{3}{4}\begin{bmatrix} 12 & 28 \end{bmatrix}$

5. Find the determinant of each matrix.
   a. $\begin{vmatrix} 15 & 6 \\ 2 & 3 \end{vmatrix}$ b. $\begin{vmatrix} -7 & -4 \\ 3 & 6 \end{vmatrix}$

6. Find the value.
$$f(x) = 2x + 7$$
$$g(x) = x^2 - 1$$

   a. f(5)
   b. g(-3)
   c. f(x + 3)
   d. g(4w)
   e. f(g(x))
   f. g(f(x))
   g. f(f(3))

7. Graph the system. Shade ONLY the INTERSECTION.

$y \leq -\frac{1}{2}x + 4$
$2x - 3y \geq 6$
$y < 3$
$x < 9$

8. You are going into to business selling cakes. You buy a used food truck for $4000. It costs you $6 to make each cake. You sell the cakes for $38.

   a. Write an equation C(x) that represents your business costs.

   b. How much does it cost to make 100 cakes? 200 cakes?

   c. Write an equation R(x) that represents your revenue from selling cakes.

   d. How much do you make when you sell 100 cakes? 200 cakes?

   e. Set the equations equal to each other and find the break-even point.

Calculator Section:

Solve the systems.

9. $8x + 7y = -18$
   $6x + 11y = -2$

10. $-3x + 2y + 8z = 29$
    $4x + 7y - 2z = -5$
    $6x - 3y + 4z = 41$

11. Calculate the determinant. $\begin{vmatrix} 5 & -7 & 2 \\ 4 & 3 & 11 \\ 2 & -1 & 6 \end{vmatrix}$

12. Determine whether the systems are independent, dependent, or inconsistent.

a. $12x + 8y = 28$
$15x + 10y = 35$

b. $15x + 10y = 35$
$18x + 12y = 36$

13. Two goats climbing up a mountain. The black goat starts at an elevation of 64 feet and he climbs 4 feet up every minute. The white goat starts at an elevation of 11 feet and he climbs 6 feet up every minute.

a. Write an equation that represents the black goat's altitude.

b. What is the black goat's elevation at 15 minutes?

c. Write an equation that represents the white goat's altitude.

d. What is the white goat's elevation at 15 minutes?

e. Calculate the time when the two goats will be at the same elevation.