

# Midterm Review

Algebra 2

Name \_\_\_\_\_

Hour \_\_\_\_\_

## Chapter 1 TEST REVIEW

1. Find the value of each expression.

a.  $4(12 - 4^2)$

b.  $12 - [20 - 2(6^2 \div 3 \times 2^2)]$

c.  $[4(5 - 3) - 2(4 - 8)] \div 16$

d.  $\frac{-8(13-37)}{6}$

2. Evaluate each expression if  $a = \frac{3}{4}$ ,  $b = (-8)$ ,  $c = (-2)$ ,  $d=3$ , and  $e=\frac{1}{3}$ .

a.  $ab^2 - d$

b.  $\frac{d(b-c)}{ac}$

c.  $-b[a + (c - d)^2]$

3. The formula  $F = \frac{9}{5}C + 32$  gives the temperature in degrees Fahrenheit for a given temperature in degrees Celsius. That is the temperature in degrees Fahrenheit when the temperature is (-40) degrees Celcius?

4. Name the sets of numbers to which each number belongs.

a.  $\frac{6}{7}$

b. 0

c.  $\frac{\sqrt{36}}{9}$

d. 3

5. Simplify each expression.

a.  $8(3a - b) + 4(2b - a)$

b.  $12\left(\frac{a}{3} - \frac{b}{4}\right)$

c.  $2.5m(12 - 8.5)$

6. Write an algebraic expression to represent each verbal expression.

a. 2 more than the quotient of a number and 5

b. 1 less than twice the square of a number

7. Solve each equation.

a.  $14 = 8 - 6r$

b.  $-1.6b + 5 = -7.8$

c.  $5(6 - 4w) - w + 21$

d.  $6y - 5 = -3(2y + 1)$

8. Solve each equation or formula for the specified variable.

a.  $E = mc^2$  for  $m$

b.  $C = \frac{2d+1}{3}$  for  $d$ .

c.  $h = vt - gt^2$  for  $v$

9. Evaluate each expression if  $a = (-1)$ ,  $b = (-8)$ ,  $c = 5$ , and  $d = (-1.4)$ .

a.  $-6|10a - 12|$

b.  $|2b - 1| - |-8b + 5|$

10. Solve each equation. Check your solutions.

a.  $|n - 4| = 13$

b.  $-3|4x - 9| = 24$

c.  $5 - 3|2 + 2w| = -7$

11. Solve each inequality. Graph your solution on a number line.

a.  $8x - 6 \geq 10$

b.  $-3(4w - 1) > 18$

c.  $-10 < 3x + 2 \leq 14$

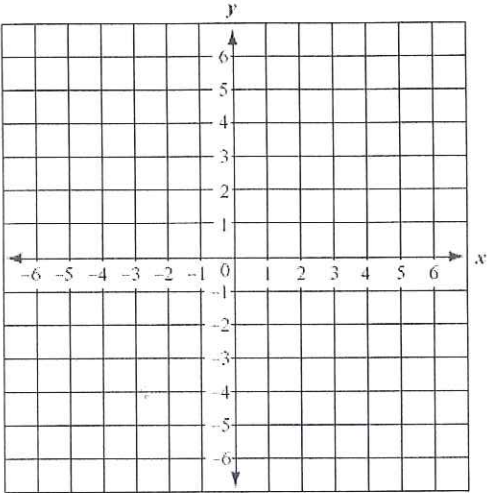
d.  $5k + 2 < -13$  or  $8k - 1 > 19$

e.  $|y + 5| < 2$

f.  $|x - 8| \geq 3$

Chapter 2 Test Review  
Algebra 2

1) Use the relation  $\{(-5,1),(2,4),(1,-4)\}$  to answer the following

<p>a) Graph the relation:</p> 	<p>b) Identify the Domain:</p>	<p>d) Is the relation a function? Explain.</p>
	<p>c) Identify the Range:</p>	<p>e) Is this continuous or discrete?</p>

2) Find each function value.

<p>a) <math>f(-3)</math> if <math>f(x) = \frac{x^2 - 4}{x + 7}</math></p>	<p>b) <math>g(3a)</math> if <math>g(x) = x^2 - 4x - 2</math></p>
---	--

3) Identify which equations are linear. If they are not linear, explain why.

<p>a) <math>f(x) = \frac{5}{x+6}</math></p>
<p>b) <math>y^2 = 3x + 1</math></p>
<p>c) <math>x = 10</math></p>
<p>d) <math>y = \frac{3}{5}x - 6</math></p>

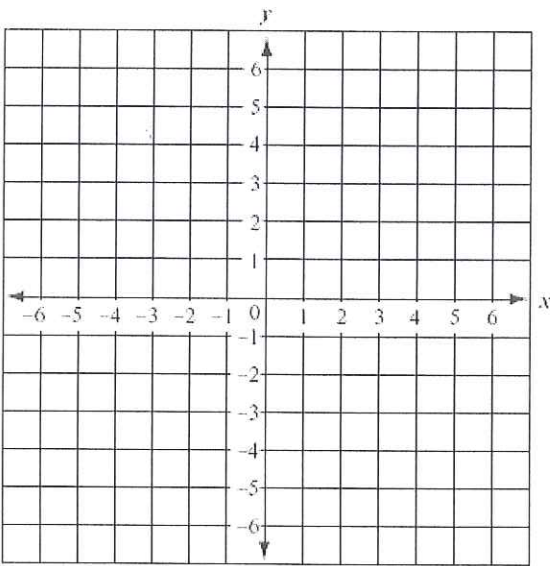
4) What is the x-intercept and y-intercept of the graph of  $2x - 8y = 16$ ?

a) x-intercept = \_\_\_\_\_

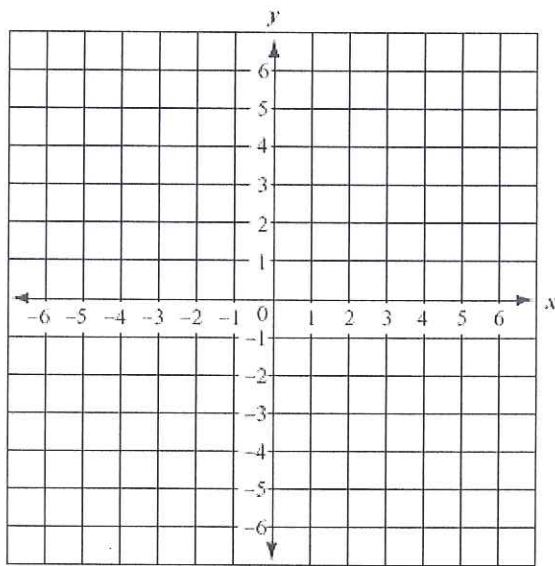
b) y-intercept = \_\_\_\_\_

5) Graph the line that satisfies each set of conditions.

a) Passes through (1,2) and parallel to the line  $4y = -2x + 5$



b) Passes through (-2,3) and perpendicular to the graph of  $x + y = 10$

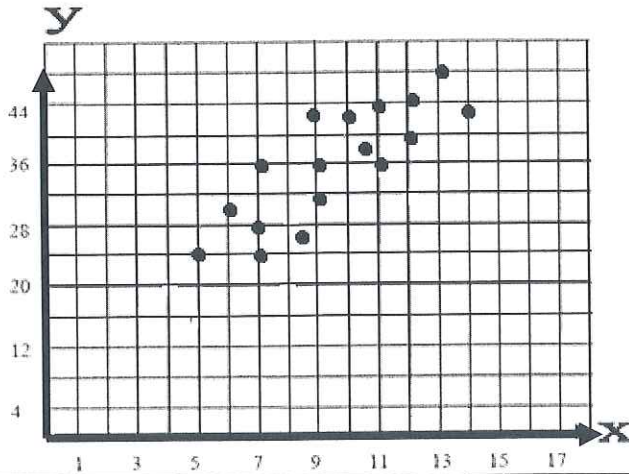


6) Write an equation for the line that satisfies each requirement in Slope-Intercept Form.

a) Passes through (1,-4) and (3,7)

b) Passes through (4,0) and perpendicular to the line of  $x + 4y = -4$

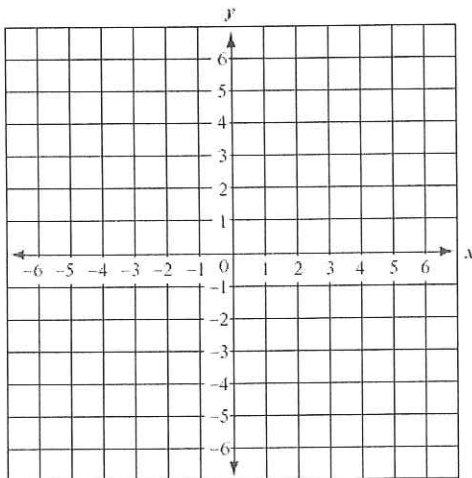
7) Use the scatter plot below to answer the following questions.



<p>a) Draw a line of best fit (use a straight edge!!!!)</p>	<p>c) Does the graph indicate a positive correlation, negative correlation or no correlation between the domain and range?</p>
<p>b) Write a prediction equation (be sure to identify which two point you use).</p>	<p>d) Make a prediction for y if the x-value is 20.</p>

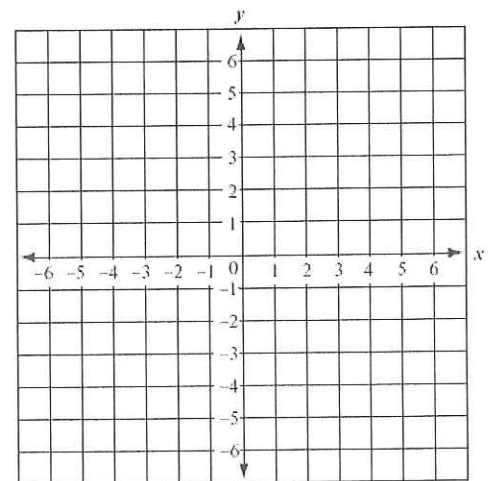
8) Graph the following equations or inequalities. Label the domain and range. Be sure to shade the appropriate areas when necessary.

a)  $y \geq -\frac{5}{4}x + 3$



Domain: \_\_\_\_\_ Range: \_\_\_\_\_

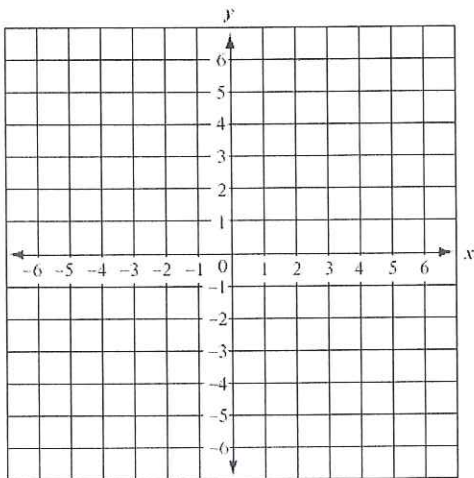
b)  $y < |x| + 4$



Domain: \_\_\_\_\_ Range: \_\_\_\_\_

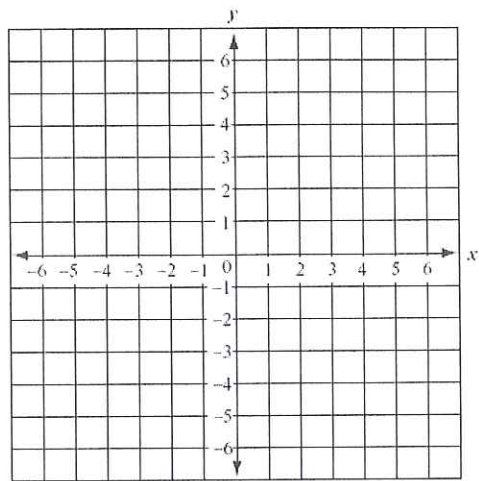


c)  $f(x) = \lceil x \rceil - 2$



Domain: \_\_\_\_\_ Range: \_\_\_\_\_

d)  $g(x) = \begin{cases} -x - 1, & x < 1 \\ x + 1, & x \geq 1 \end{cases}$



Domain: \_\_\_\_\_ Range: \_\_\_\_\_

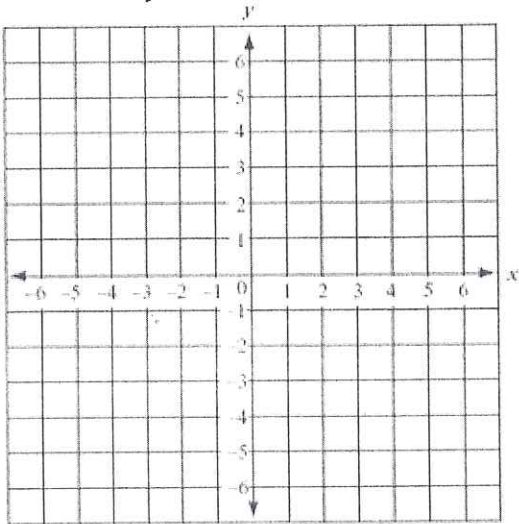
Name: \_\_\_\_\_ Date: \_\_\_\_\_ Hour: \_\_\_\_\_

Algebra 2  
Chapter 3 PRACTICE Test

Solve the systems using the method given. Then state whether the solution is consistent and independent, consistent and dependent or inconsistent.

Solve the System by Graphing.

$$\begin{aligned} 1) \quad & 2x - 4y = 8 \\ & x + y = 2 \end{aligned}$$



Solve the System by Substitution

$$\begin{aligned} 2) \quad & 4x - y = 10 \\ & y - 3x = -6 \end{aligned}$$

Solve the System by Elimination

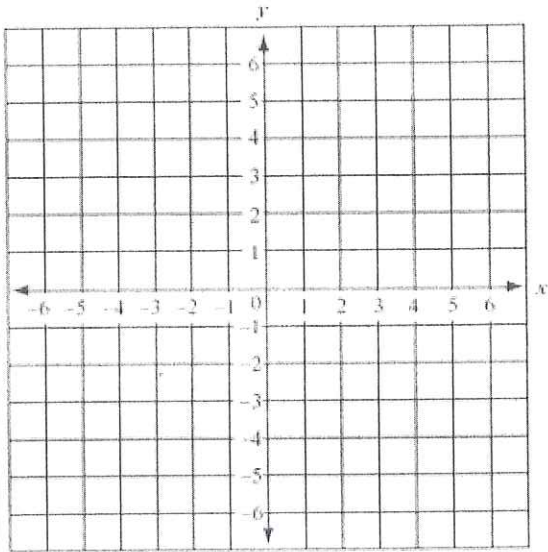
$$\begin{aligned} 3) \quad & 5x + 2y = 1 \\ & 2x + 3y = 7 \end{aligned}$$

Solve the System of Equations

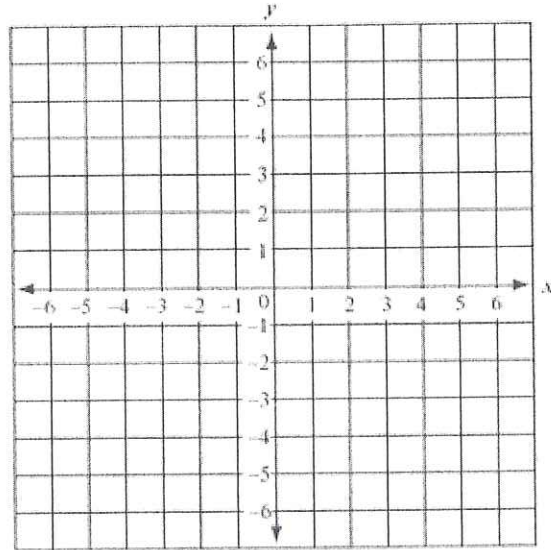
$$\begin{aligned} 4) \quad & 5x - 3y = 16 \\ & 2x + 7y = -10 \end{aligned}$$

Solve the following systems of inequalities by graphing.

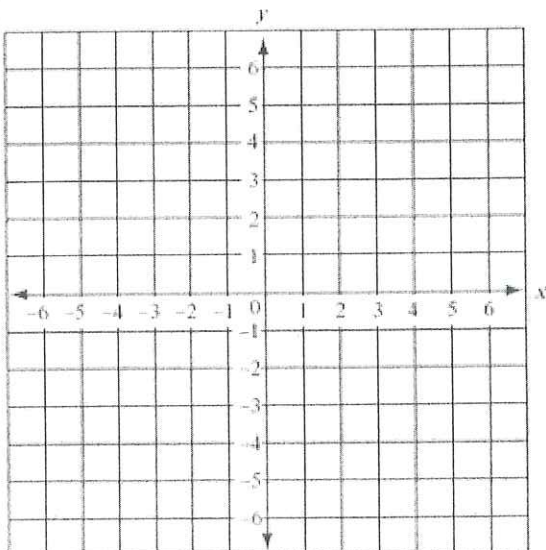
5)  $2x - 3y \geq -3$   
 $3y > -2x - 6$



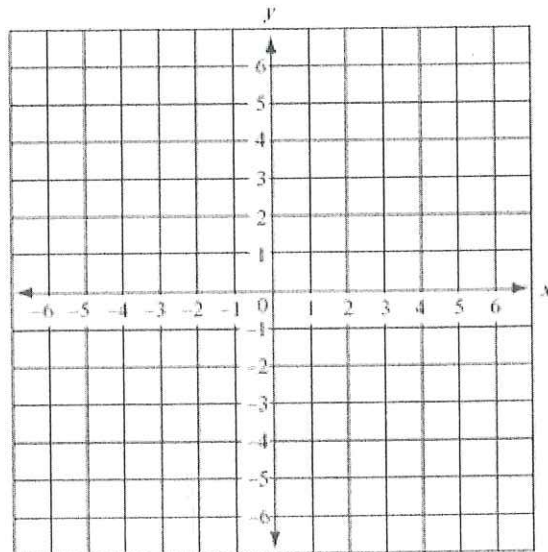
6)  $|y| < 4$   
 $y < x + 2$



7)  $x + y \geq -3$   
 $x - 2y \leq 4$



8) Find the vertices of the figure formed by  
 $x \geq -3$   
 $y \geq -2$   
 $2x + y \leq -2$



9) A printing company sells small packages of personalized stationary for \$7 each, medium packages for \$12 each, and large packages for \$15 each. Yesterday, the company sold 9 packages of stationary, collecting a total of \$86. Three times as many medium packages were sold as large packages. Write a system of three equations that represents the number of packages sold. Find the number of packages sold.

10) Solve the system of equations.

$$x + 2y - 3z = 5$$

$$x - y + 2z = -3$$

$$x + y - z = 2$$

Name: \_\_\_\_\_ Date: \_\_\_\_\_ Hour: \_\_\_\_\_

Algebra 2  
Chapter 4 Test Review

Solve each equation.

1.  $\begin{bmatrix} x + y \\ 4x - 3y \end{bmatrix} = \begin{bmatrix} 1 \\ 11 \end{bmatrix}$

2.  $-2 \begin{bmatrix} w + 5 & x - z \\ 3y & 8 \end{bmatrix} = \begin{bmatrix} -16 & -4 \\ 6 & 2x + 8z \end{bmatrix}$

Perform the indicated matrix operations.

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

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

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

6.  $1.3 \begin{bmatrix} 3.7 \\ -5.4 \end{bmatrix} + 4.1 \begin{bmatrix} 6.4 \\ -3.7 \end{bmatrix} - 6.2 \begin{bmatrix} -0.8 \\ 7.4 \end{bmatrix}$

Use matrices A, B, C, D, and E to find the following:

$$A = \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}, B = \begin{bmatrix} -1 & 0 \\ 0 & -1 \end{bmatrix}, C = \begin{bmatrix} 2 & -2 \\ -3 & 3 \end{bmatrix}, D = \begin{bmatrix} -2 & 2 \\ 3 & -3 \end{bmatrix}, E = \begin{bmatrix} 5 & -3 \\ -2 & 4 \end{bmatrix}$$

7.  $A + B$

9.  $C + D$

11.  $4B$

8.  $E + 2A$

10.  $2A + 3E - D$

Find each product, if possible.

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

14.  $\begin{bmatrix} 5 & 2 \\ 4 & -5 \end{bmatrix} * \begin{bmatrix} 5 & 10 \\ 15 & 20 \end{bmatrix}$

13.  $\begin{bmatrix} 5 & 10 \\ 15 & 20 \end{bmatrix} * \begin{bmatrix} -1 & 2 \\ 7 & 10 \\ -5 & 0 \end{bmatrix}$

15.  $\begin{bmatrix} 5 & 1 & -8 \\ 4 & -2 & 11 \end{bmatrix} * \begin{bmatrix} -1 & 2 \\ 7 & 10 \\ -5 & 0 \end{bmatrix}$

16. State the dimensions of each matrix.

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

b.  $\begin{bmatrix} 6 \\ -3 \\ 2 \end{bmatrix}$

c.  $\begin{bmatrix} x - 2y \\ 3x - 4y \end{bmatrix}$

For each of the following, calculate the determinant.

17.  $\begin{vmatrix} 8 & -5 \\ -6 & 4 \end{vmatrix}$

18.  $\begin{vmatrix} 10 & 3 \\ 5 & -2 \end{vmatrix}$

Calculate the determinant using expansion of minors.

19.  $\begin{vmatrix} 2 & -3 & 5 \\ 1 & -2 & -7 \\ -1 & 4 & -3 \end{vmatrix}$

20.  $\begin{vmatrix} 4 & 3 & -2 \\ 2 & 5 & -8 \\ 6 & 4 & 1 \end{vmatrix}$

Calculate the determinant using diagonals.

21.  $\begin{vmatrix} 6 & 12 & 15 \\ 9 & 3 & 14 \\ 5 & 6 & 3 \end{vmatrix}$

Use Cramer's Rule to solve each system of equations.

22.  $-x + y = 5$   
 $2x + 4y = 38$

23.  $2a + b - c = -6$   
 $a - 2b + c = 8$   
 $-a - 3b + 2c = 14$



Determine whether each pair of matrices are inverses.

24.  $A = \begin{bmatrix} -7 & -6 \\ 8 & 7 \end{bmatrix}$  and  $B = \begin{bmatrix} -7 & -6 \\ 8 & 7 \end{bmatrix}$

25.  $C = \begin{bmatrix} -3 & 4 \\ 2 & -2 \end{bmatrix}$  and  $D = \begin{bmatrix} -2 & -2 \\ -4 & -3 \end{bmatrix}$

Find the inverse of each matrix, if it exists.

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

27.  $\begin{bmatrix} 10 & 3 \\ 5 & -2 \end{bmatrix}$

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