

Name: Answer Key

COMMON CORE ALGEBRA I: UNIT #5 Study Guide

Study Guide

PART I QUESTIONS: Show all of your work.

1. Which of the following is the  $x$ -coordinate of the solution to the system shown below?

$x = \frac{5}{}$

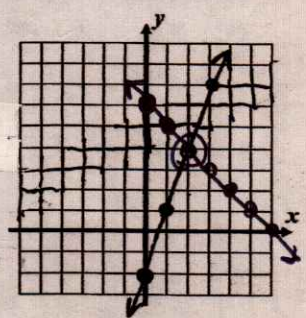
$$\begin{array}{r} 2x + 3y = 18 \\ 4x - 3y = 12 \\ \hline 6x = 30 \\ \div 6 \\ \hline x = 5 \end{array}$$

2. The line  $y = 3x - 2$  is graphed. Graph the other line  $y = -x + 6$ . Which of the following would be the  $y$ -coordinate of the solution when both lines are graphed?

$y = \frac{4}{}$

is the solution  $(2, 4)$   
 $x \quad y$

x	y
0	6
1	5
2	4
3	3



3. Which of the following equations would have a solution that is the same as the solution to the system?

$$\begin{aligned} 5x - 3y &= -8 \\ 5(6) - 3(2) &= -8 \\ 30 - 6 &= -8 \\ 24 &= -8 \end{aligned}$$

Solution  $(6, 2)$   
 $(x, y)$

Substitute  $x = 6$

$$\begin{aligned} 4x + 7y &= 38 \\ 4(6) + 7y &= 38 \\ 24 + 7y &= 38 \\ -24 & \quad -24 \\ 7y &= 14 \\ \div 7 & \quad \div 7 \\ y &= 2 \end{aligned}$$

Circle: True or **False**

4. Is  $(4, 8)$  a solution to the system of equations?  
 $x \quad y$

Both are True. So,  $(4, 8)$  is a solution to this system.

$y = 5x - 12$	$y = -3x + 20$
$(8) = 5(4) - 12$	$(8) = -3(4) + 20$
$8 = 20 - 12$	$8 = -12 + 20$
$8 = 8$	$8 = 8$
True	True



# Unit 5 Study Guide

5. The quadratic functions  $f(x) = -x^2 + 8$  and  $g(x) = \frac{1}{3}x - 2$  are shown. The positive solution to  $f(x) = g(x)$  is which of the following.

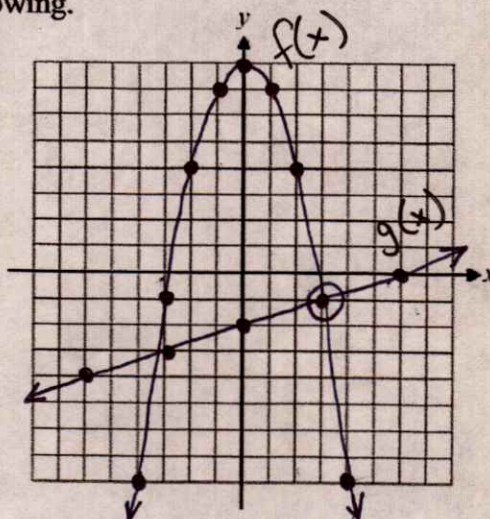
Write a solution.

$(\frac{3}{-}, \frac{-1}{-})$

↑  
x value    ↑  
y value

on both tables

x	f(x)	x	g(x)
-3	-1	-3	-3
-1	7	0	-2
1	7	3	-1
3	-1	6	0



6. Which of the following points is a solution to the system of inequalities shown graphed below?

↓ dotted and below Write a solution

$$y < \frac{1}{2}x - 2$$

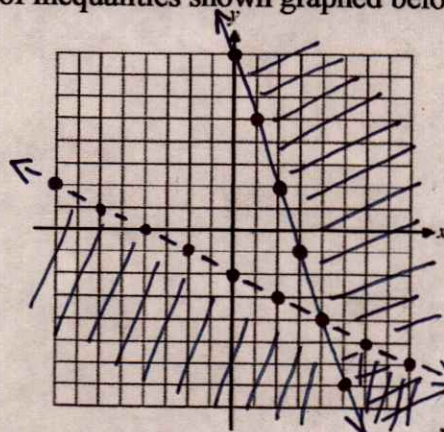
$$y \geq -3x + 8$$

↑  
solid and above

$(\frac{7}{-}, \frac{-1}{-})$

Is this point in the double shaded?

Yes



7. Which of the following is the value of y that solves the system of equations shown below?

$$5x + 6y = 51$$

$$y = 2x$$

$$5x + 6(2x) = 51$$

$$5x + 12x = 51$$

$$17x = 51$$

$$\div 17 \quad \div 17$$

$x = 3$

$$y = 2(3)$$

$y = 6$

$(3, 6)$

Many different answers

8. At what point do the lines  $y = 2x - 5$  and  $y = -2x + 3$  intersect? Show Mr. V the calculator.

$$\begin{array}{r} 2x - 5 = -2x + 3 \\ +2x \quad \quad +2x \\ \hline 4x - 5 = 3 \end{array}$$

$$\begin{array}{r} 4x - 5 = 3 \\ +5 \quad +5 \\ \hline 4x = 8 \end{array}$$

$$\begin{array}{r} 4x = 8 \\ \div 4 \quad \div 4 \\ \hline x = 2 \end{array}$$

$x = 2$

$$y = 2x - 5$$

$$y = 2(2) - 5$$

$$y = 4 - 5$$

$y = -1$

$(2, -1)$



**PART II QUESTIONS: Show all of your work.** *Key* Unit 5 Study Guide

9. Find the value of  $x$  that solves the system shown below. Show the work that leads to your answer.

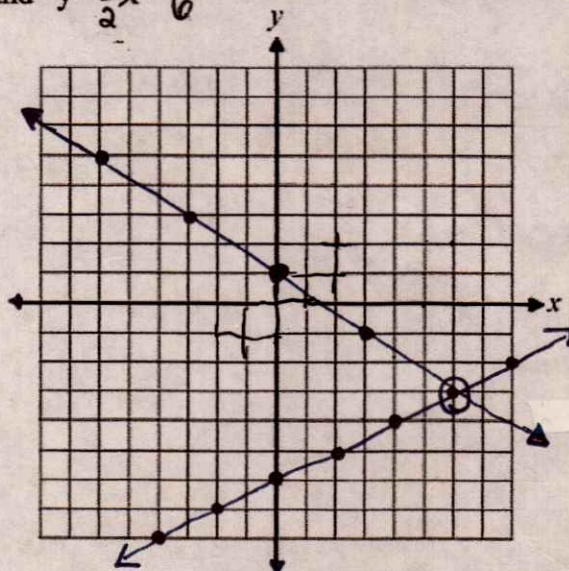
$$\begin{pmatrix} -6, -18 \\ x \quad y \end{pmatrix}$$

The point  $(-6, -18)$  is the Solution.

$x = -6$  is the  $x$ -value of the Solution.

$$\begin{aligned} y &= 3x \quad \text{and} \quad 2x + y = -30 \\ y &= 3(-6) \\ y &= -18 \\ 2x + (3x) &= -30 \\ 5x &= -30 \\ \div 5 \quad \div 5 & \\ \boxed{x = -6} \end{aligned}$$

10. Graph the system of equations.  $y = \frac{-2}{3}x + 1$  and  $y = \frac{1}{2}x - 6$



11. What is the solution to #10?

intersection of the lines  $\left( \frac{6}{x}, \frac{-3}{y} \right)$

**PART III QUESTIONS: Show all of your work.**

12. Solve the following system of equations algebraically. for the solution.

$$\left( \frac{6}{x}, \frac{-5}{y} \right)$$

$$\begin{aligned} 5x + 2y &= 20 \\ 5(6) + 2y &= 20 \\ 30 + 2y &= 20 \\ -30 \quad -30 & \\ 2y &= -10 \\ \div 2 \quad \div 2 & \\ \boxed{y = -5} \end{aligned}$$

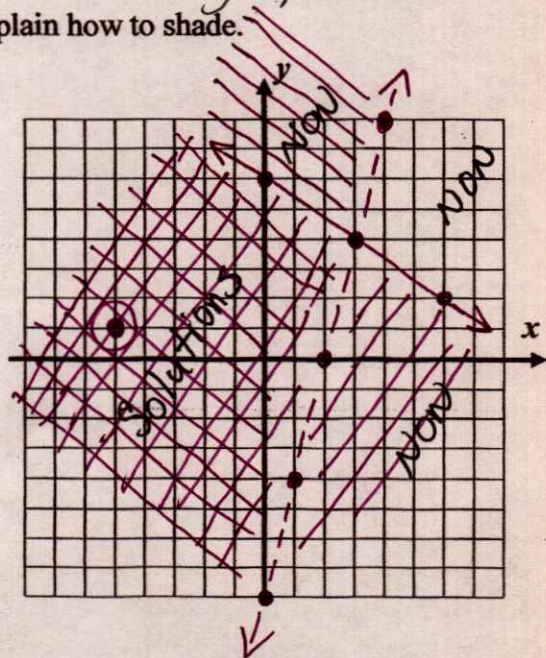
$$\begin{aligned} 5x + 2y &= 20 \\ -2y - x &= 4 \\ 4x &= 24 \\ \div 4 \quad \div 4 & \\ \boxed{x = 6} \end{aligned}$$



# Unit 5 Study Guide

13. Sketch the graph to the system of inequalities shown below. Explain how to shade.

<p><u>Dotted</u> OR Solid</p> $y > 4x - 8$ <table border="1" style="margin-left: 20px;"> <tr><td>x</td><td>y</td></tr> <tr><td>0</td><td>-8</td></tr> <tr><td>2</td><td>0</td></tr> <tr><td>4</td><td>8</td></tr> </table> <p><u>Shade Above</u> OR Below</p>	x	y	0	-8	2	0	4	8	and	<p><u>Dotted</u> OR Solid</p> $y \leq \frac{-2}{3}x + 6$ <table border="1" style="margin-left: 20px;"> <tr><td>x</td><td>y</td></tr> <tr><td>0</td><td>6</td></tr> <tr><td>3</td><td>4</td></tr> <tr><td>6</td><td>2</td></tr> </table> <p><u>Shade Above</u> OR Below</p>	x	y	0	6	3	4	6	2	
x	y																		
0	-8																		
2	0																		
4	8																		
x	y																		
0	6																		
3	4																		
6	2																		



14. Graph the point  $(-5, 1)$ . Is it a solution to the system?

Circle  
Yes  
OR  
No

Is it in the  
double shaded? yes

15. The Poughkeepsie Drama Club is selling tickets to an upcoming play. They can sell 500 tickets. The adult tickets sell for \$10 each and student tickets cost free. They would like to raise \$3,000. If  $x$  represents the number of adult tickets and  $y$  represents the number of student tickets, answer the following.

Write a system of equations that models this situation.

$x$	+	$y$	=	500		$10x$	+	$0y$	=	3000				
Number of adult tickets		number of student tickets		Number of All tickets		cost of 1 Adult ticket		number of Adult tickets		Cost of 1 Student ticket		number of Student tickets		Cost of All tickets

16. A party is thrown where 20 tables are used. Each table either sits 8 people or 10 people. A total of 170 people can be sat at the tables. If  $E$  represent the number of 8 person tables and  $T$  represents the number of 10 person tables, write a system of equations that models this situation.

$E$	+	$T$	=	20		$8E$	+	$10T$	=	170				
Number of Eight person Tables		Number of Ten person Tables		Total number of tables		number of seats per one eight person Table		number of Eight person Tables		number of seats per one Ten person Table		number of Ten person Tables		Total seats in the room