

# CV | Algebra II

## Mid Chapter 3 Quiz

NAME Key

Solve each system of equations. (5 points each)

1.  $-4x - 16y = -96$   
 $7x + 3y = 68$

$(8, 4)$

2.  $8f + 3g = 12$   
 $-32f - 12g = 48$

No Solution

3.  $2a - 5b = -20$   
 $2a + 5b = 20$

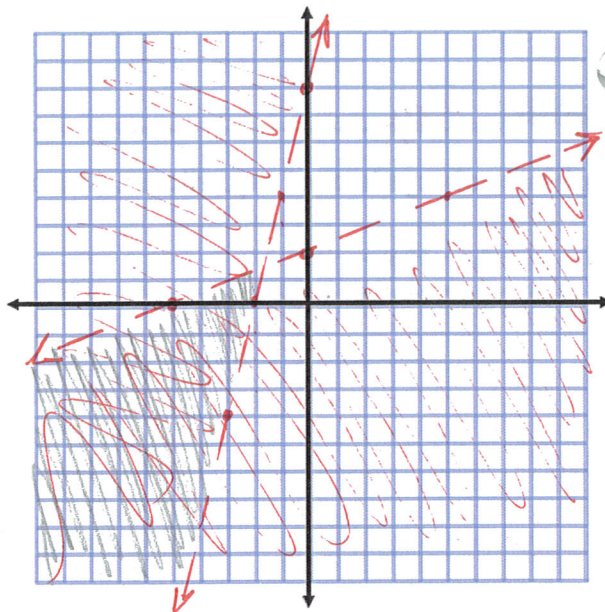
$(0, 4)$

4. In the election for student council, Candidate A received 55% of the total votes, while Candidate B received 1541 votes. If candidate C received 40% of the votes that Candidate A received, how many total votes were cast? (4 points)

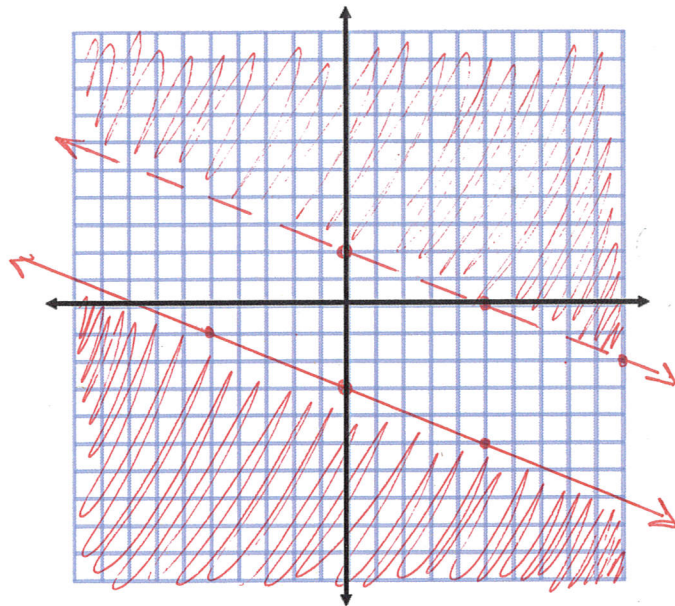
6,700 votes

Solve each system of inequalities by graphing. (4 points each)

5.  $5y < 2x + 10$       $y < \frac{2}{5}x + 2$   
 $y - 4x > 8$           $y > 4x + 8$



6.  $y > -\frac{2}{5}x + 2$   
 $5y \leq -2x - 15$   
 $y \leq -\frac{2}{5}x - 3$



Graph each system of inequalities. Name the coordinates of the vertices of the feasible region. Find the maximum and minimum values of the given function for this region. (5 points each)

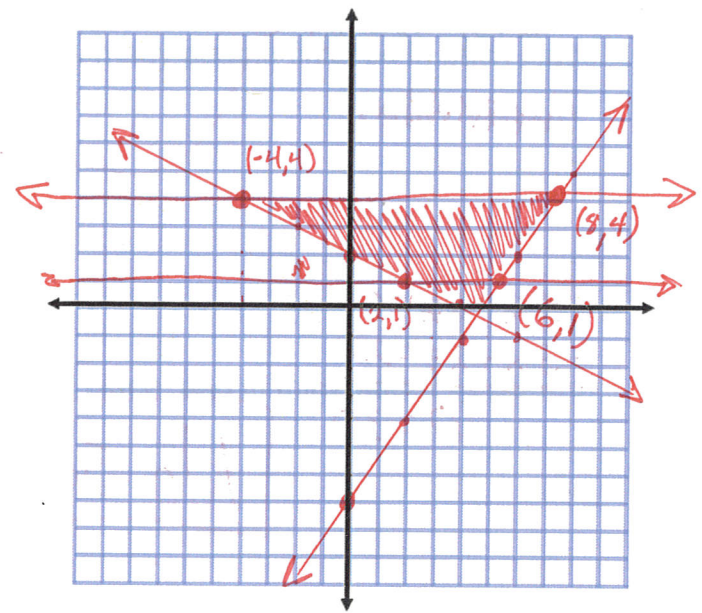
7.

$$\begin{aligned}
 1 &\leq y \leq 4 \\
 4y - 6x &\geq -32 \rightarrow 4y \geq 6x - 32 \\
 2y &\geq -x + 4 \\
 f(x,y) &= -6x + 3y
 \end{aligned}$$

$$\begin{aligned}
 y &= \frac{6}{4}x - 8 \\
 1 &= \frac{6}{4}x - 8 \\
 9 &= \frac{6}{4}x \\
 36 &= 6x \\
 6 &= x
 \end{aligned}$$

$(x,y)$	$f(x,y)$
-4,4	36
2,1	-9
6,1	-33
8,4	-36

max: 36  
min: -36

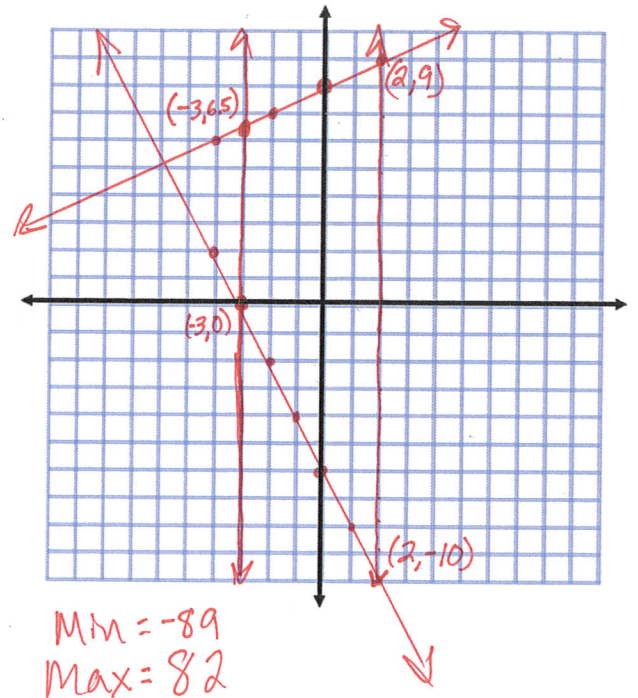


8.

$$\begin{aligned}
 2 &\geq x \geq -3 \\
 y &\geq -2x - 6 \\
 4y &\leq 2x + 32 \rightarrow y \leq \frac{1}{2}x + 8 \\
 f(x,y) &= -4x - 9y
 \end{aligned}$$

$(x,y)$	$f(x,y)$
(-3,6.5)	-46.5
(-3,0)	12
(2,-10)	82
(2,9)	-89

Min = -89  
Max = 82



Solve each system of equations. (6 points each)

9.  $2x - y + z = 1$   
 $x + 2y - 4z = 3$   
 $4x + 3y - 7z = -8$

No Solution

$$4x - 2y + 2z = 2$$

$$x + 2y - 4z = 3$$

$$\hline 5x - 2z = 5$$

~~4x + 3y - 7z = -8~~

$$3x + 6y - 12z = 9$$

$$-8x - 6y + 14z = 16$$

$$\hline -5x + 2z = 25$$

$$5x - 2z = 5$$

$$-5x + 2z = 25$$

$$\hline 0 = 30$$

No Solution

10.  $x + 2y = 12$   
 $3y - 4z = 25$   
 $x + 6y + z = 20$

(6, 3, -4)

11. A friend e-mails you the results of a recent high school swim meet. The e-mail states that 24 individuals placed, earning a combined total of 53 points. First place earned 3 points, second place earned 2 points, and third place earned 1 point. There were as many first-place finishers as second- and third-place finishers combined.

- a. Write a system of three equations that represents how many people finished in each place. (2 points)

$$x + y + z = 24$$

$$3x + 2y + z = 53$$

$$x = y + z$$

- b. How many swimmers finished in first place, in second place, and in third place? (2 points)

$$1^{\text{st}} = 12$$

$$2^{\text{nd}} = 5$$

$$3^{\text{rd}} = 7$$

- c. Suppose the e-mail had said that the athletes scored a combined total of 47 points. Explain why this statement is false and the solution is unreasonable. (2 points)

This statement is false because 2<sup>nd</sup> place would yield a negative answer.