

Name:  
Date:  
Period:

**Directions:** You have one class period to complete this assessment. Show all of your work and do your best!

Multiple-Choice:

1. Use the following equations to solve for  $x$  and  $y$  with equation substitution (2 pts):

$$\begin{aligned}x+y&=7 \\ x+2y&=11\end{aligned}$$

- A.  $x=4, y=3$
- B.  $x=7, y=0$
- C.  $x=6, y=1$
- D.  $x=3, y=4$

2. Use the following equations to solve for  $x$  and  $y$  by adding/subtracting equations (2 pts):

$$\begin{aligned}2x+y&=9 \\ 6x+4y&=30\end{aligned}$$

- A.  $x=4, y=4$
- B.  $x=0, y=9$
- C.  $x=3, y=3$
- D.  $x=6, y=2$

Matching:

Match the following systems of equations to the appropriate solution (1 pt each) use the space below to show your work:

3.  $4x - 6y = 12$   
 $2x + 2y = 6$

\_\_\_\_\_

4.  $y = x - 5$   
 $5x - y = -5$

\_\_\_\_\_

5.  $x - y = -3$   
 $2x - y = 4$

\_\_\_\_\_

A. (7,10)

B. (3,0)

C. (-2.5, -7.5)

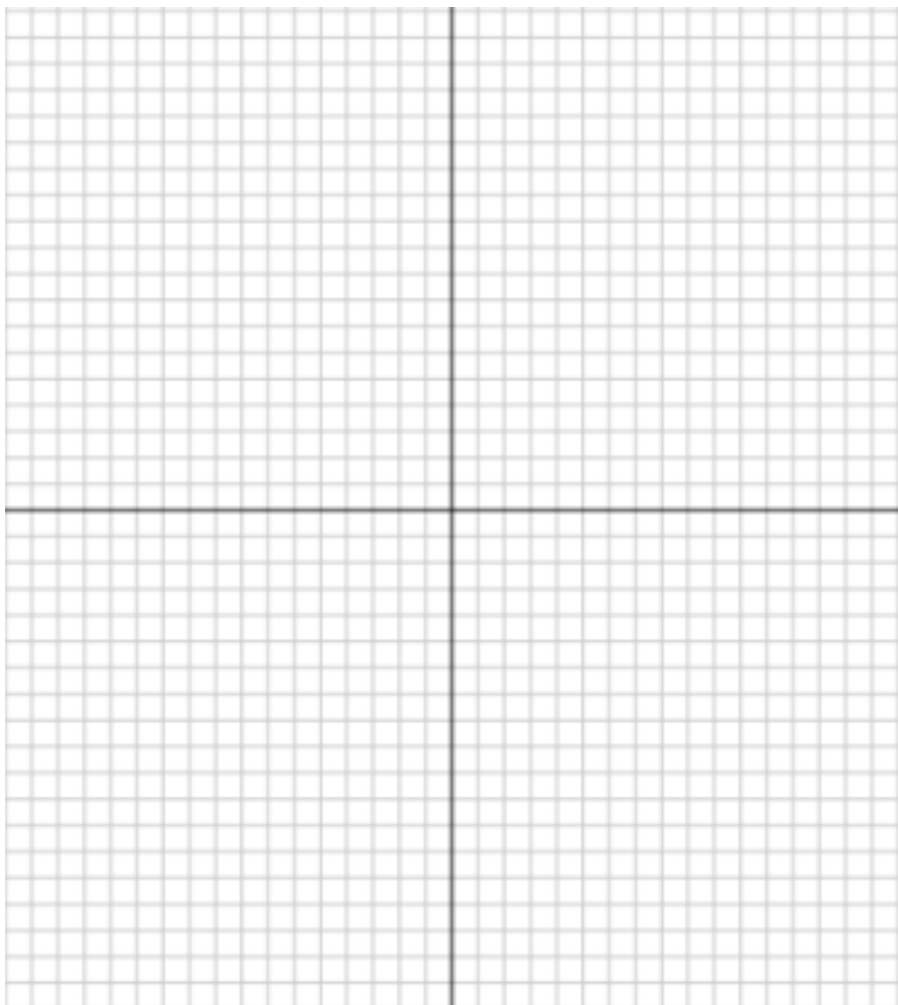
6. The admission fee at a small fair is \$1.50 for children and \$4.00 for adults. On a certain day, 2200 people enter the fair and \$5050 is collected. How many children and how many adults attended? Show and check all of your work. (4 pts)

7. A test has twenty questions worth 100 points. The test consists of True/False questions worth 3 points each and multiple choice questions worth 11 points each. How many multiple-choice questions are on the test? Show and check all of your work. (4 pts)

8. First, find the solution(s) to this system of equations. Second, create a graph to check your work. Show all work. Remember, there can be 1 solution, 2 solutions or 0 solutions! (6 pts)

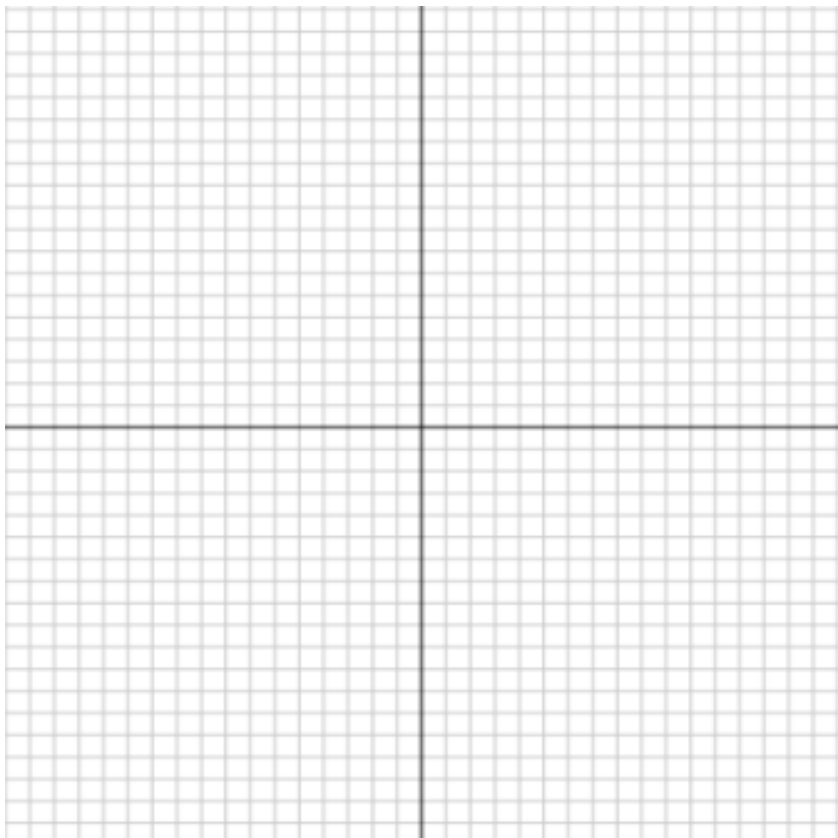
$$y = x^2 - 5x + 7$$

$$y = 2x + 1$$



9. Graph the following system of inequalities. Based on your graph, what are the domain and range of the solution? Show your work and label your graph appropriately. (4 pts)

$$y \geq -3x^2 + 4 \text{ and } y \leq x^2$$



10. Reflect on your learning for this unit (2 pts):

a. On a scale of 1 to 5, rate your understanding of systems of equations and inequalities. 1 being you didn't understand a thing we went over in class and 5 being you are an expert and could teach a class on systems of equations.

1

2

3

4

5

b. Write 2-4 sentences about a time you used a system of equations in your life outside of school and schoolwork.

c. If you could ask Miss Gleit one thing, what would it be?

## Answer Key and Scoring Guide:

### Standards: CCSS-Math A-REI: Reasoning with equations and inequalities

**5:** Prove that, given a system of two equations in two variables, replacing one equation by the sum of that equation and a multiple of the other produces a system with the same solutions.

**6:** Solve systems of linear equations exactly and approximately (e.g., with graphs), focusing on pairs of linear equations in two variables.

**7:** Solve a simple system consisting of a linear equation and a quadratic equation in two variables algebraically and graphically. For example, find the points of intersection between the line  $y = -3x$  and the circle  $x^2 + y^2 = 3$ .

**10:** Understand that the graph of an equation in two variables is the set of all its solutions plotted in the coordinate plane, often forming a curve (which could be a line).

1. D- 1 point for correct answer, 1 point for showing work and solving using substitution method

Handwritten work for problem 1 using the substitution method:

$$\begin{aligned} X + Y &= 7 \\ X + 2Y &= 11 \end{aligned}$$

Isolate variable  $Y = 7 - X$  (labeled "isolate variable")

Insert  $Y = 7 - X$  into the second equation (labeled "insert"):

$$\begin{aligned} X + 2(7 - X) &= 11 \\ X + 14 - 2X &= 11 \\ -X + 14 &= 11 \\ -X &= -3 \\ X &= 3 \end{aligned}$$

$X = 3$  → plug into an equation

$$\begin{aligned} 3 + 2Y &= 11 \\ 2Y &= 8 \\ Y &= 4 \end{aligned}$$

check work:

$$\begin{aligned} 3 + 4 &= 7 \checkmark \\ 3 + 2(4) &= 11 \\ 3 + 8 &= 11 \\ 11 &= 11 \checkmark \end{aligned}$$

2. C- 1 point for correct answer, 1 point for showing work and solving using addition/subtraction method

Handwritten work for problem 2 using the addition/subtraction method:

$$\begin{aligned} 2x + y &= 9 \\ 6x + 4y &= 30 \end{aligned}$$

add/subtract equations:

$$\begin{aligned} 3(2x + y) &= 27 \\ - (6x + 4y) &= 30 \\ \hline -4y &= -3 \\ y &= 3 \end{aligned}$$
$$\begin{aligned} 2x + 3 &= 9 \\ 2x &= 6 \\ x &= 3 \end{aligned}$$

check work:

$$\begin{aligned} 2(3) + 3 &= 9 \\ 6 + 3 &= 9 \\ 9 &= 9 \checkmark \\ 6(3) + 4(3) &= 30 \\ 18 + 12 &= 30 \\ 30 &= 30 \end{aligned}$$

1 point for each correct answer

3. B
4. C
5. A

6. 700 adults and 1500 children attended

1 point for correct answer

2 points for showing work

1 point for showing their check work

Handwritten solution for problem 6:

1.5c \$ 4a → cost  
c # a → # attended  
c = children  
a = adults

$$\begin{aligned} \$1.50c + \$4a &= \$5050 \\ 4(c + a) &= 2200 \\ -4c + 4a &= 8800 \\ -2.5c &= -3750 \\ \boxed{c} &= \boxed{1500} \end{aligned}$$
$$\begin{aligned} c + a &= 2200 \\ 1500 + a &= 2200 \\ \boxed{a} &= \boxed{700} \end{aligned}$$

Check work

$$\begin{aligned} 1.5(1500) + 4(700) &= 5050 \\ 2250 + 2800 &= 5050 \\ 5050 &= 5050 \checkmark \end{aligned}$$
$$\begin{aligned} 700 + 1500 &= 2200 \\ 2200 &= 2200 \checkmark \end{aligned}$$

7. There are 15 True/False questions and 5 multiple-choice questions

1 point for correct answer

2 points for showing work

1 point for showing their check work

Handwritten solution for problem 7:

x = T/F questions  
y = multiple choice

$$\begin{aligned} x + y &= 20 \\ 3x + 11y &= 100 \end{aligned}$$

substitute

$$\begin{aligned} y &= 20 - x \\ 3x + 11(20 - x) &= 100 \\ 3x + 220 - 11x &= 100 \\ -8x &= -120 \\ \boxed{x} &= \boxed{15} \end{aligned}$$
$$\begin{aligned} 15 + y &= 20 \\ \boxed{y} &= \boxed{5} \end{aligned}$$

check work:

$$\begin{aligned} 5 + 15 &= 20 \\ 20 &= 20 \checkmark \\ 3(15) + 11(5) &= 100 \\ 45 + 55 &= 100 \\ 100 &= 100 \checkmark \end{aligned}$$



8. 1 point for saying there are 2 solutions  
 2 points for finding two correct solutions  
 3 points for accurate graph with labeled axes and labeled solution points

① set equal and factor

$$y = x^2 - 5x + 7$$

$$y = 2x + 1$$

$$2x + 1 = x^2 - 5x + 7$$

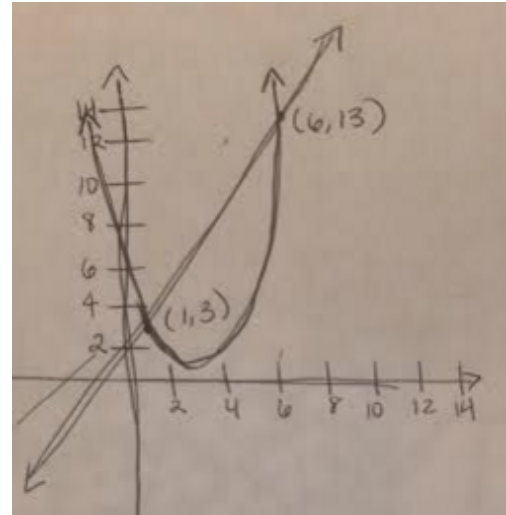
$$0 = x^2 - 7x + 6$$

$$(x - 6)(x - 1) = 0$$

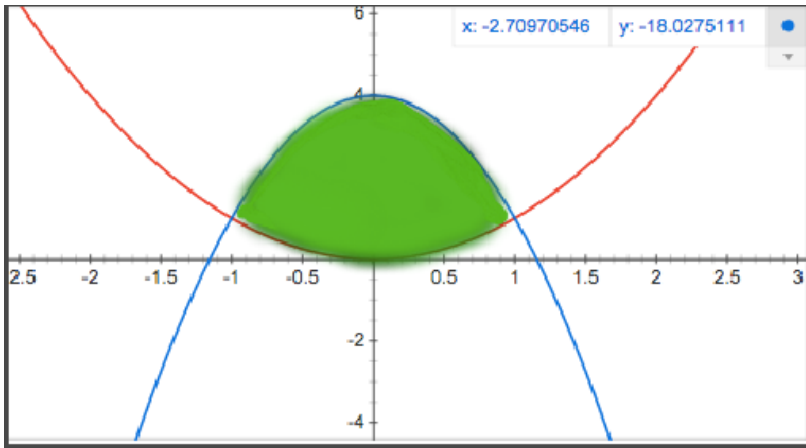
$$x = 6 \text{ \& } x = 1$$

plug back into original:  $y = (6)^2 - 5(6) + 7$   
 $y = (1)^2 - 5(1) + 7$        $y = 36 - 30 + 7$   
 $y = 1 - 5 + 7$                $y = 13$   
 $y = 3$

2 solutions:  $(1, 3)$  &  $(6, 13)$



9. Domain:  $-1 \leq X \leq 1$   
 Range:  $0 \leq Y \leq 4$



- 1 point for domain  
 1 point for range  
 2 points for accurate graph with labeled axes and shaded in solution area