Summary
In the first part of the lesson, students are asked to find the intersection between two linear or absolute value functions, values of the functions and regions where one function is greater than the other, given the graphs of the functions. Questions are asked using function notation. In the second part of the lesson, students are given two linear equations and are asked to find the intersection algebraically, and then to solve in inequality using the two functions.
Utah State Core Standard
Objective 3.2 Specify locations and describe spatial relationships using coordinate geometry. • Solve and graph systems of linear inequalities. • Use function notation. • Sketch the solutions of absolute value and quadratic inequalities of two variables on a Cartesian coordinate system.
Desired Results
Benchmark/Enduring Understanding
Students will relate function notation to the graph of a function.

Essential Questions	Skills
How does the solution to a system of equations relate to a system of inequalities?	Solving systems of equations. Solving systems of inequalities. Graphing linear functions Using function notation

Assessment Evidence
The final question prompts students to draw a conclusion about the relationship between solving systems of equations or inequalities graphically, algebraically, and numerically.

Instructional Activities
Launch: Teachers should review function notation and help students to use phrases such as: " f(2) means the value of the function at 2 or the height of the graph at 2" Explore: Students can work individually or in groups or pairs to complete the worksheet. Summarize: Discuss and confirm student responses to the final question.
Materials Needed
Copies of worksheet

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Name_____

Period_____

For each graph:

a) Find where $f(x) = g(x)$

b) Find where $f(x) > g(x)$

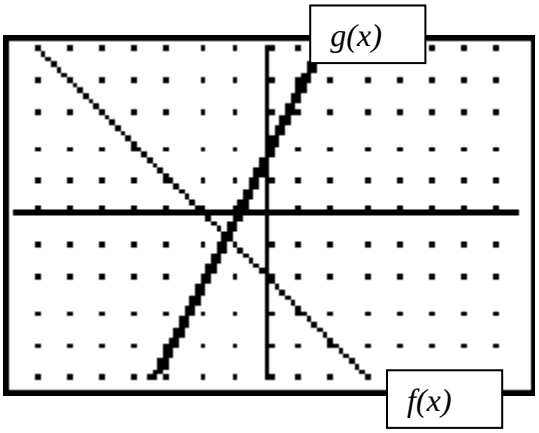
c) Find $f(0)$

d) If $f(x) = 0$, find x

e) Find $g(2)$

f) If $g(x) = 0$, find x

1.



1.

a)

b)

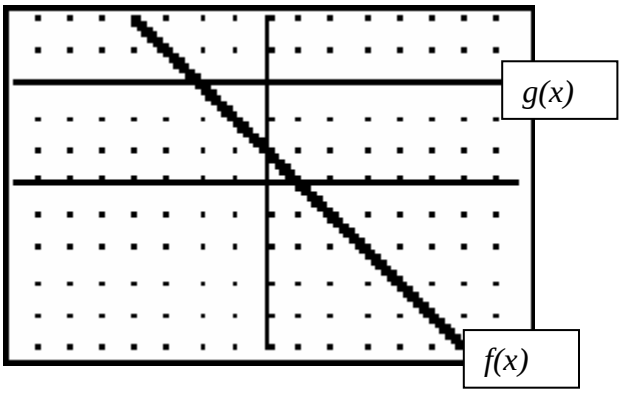
c)

d)

e)

f)

2.



2.

a)

b)

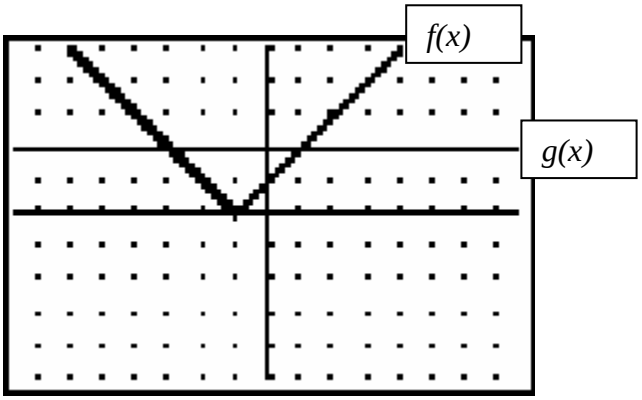
c)

d)

e)

f)

3.



3.

a)

b)

c)

d)

e)

f)

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Name_____

Period_____

I. For each pair of equations:

a) Find the intersection algebraically (using substitution or elimination).
b) Confirm the intersection graphically.
c) Algebraically, find where $y_1 > y_2$.
d) Highlight on the graph where $y_1 > y_2$
e) Make a table and substitute 3 values for x to get 3 corresponding output values. Use:
- One value of x left of intersection
- One value of x at the intersection
- One value of x right of the intersection

f) According to these output values, where is $y_1 > y_2$?

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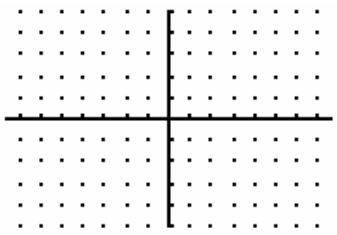
1. y_1: $2x + 3y = 6$
   y_2: $4x = y + 12$

Work:

a)

b) and d)



c)

e)

X	Y_1	Y_2

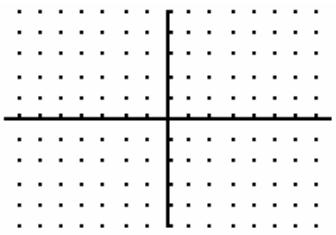
f)

2. y_1: $2x - 3y = 9$
   y_2: $x + 5y = -2$

Work:

a)

b) and d)



c)

e)

X	Y_1	Y_2

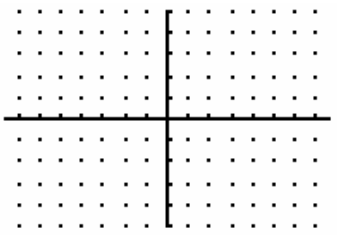
f)

3. y_1: $5x + 7y = 13$
   y_2: $2x - 5y = 13$

Work:

a)

b) and d)



c)

e)

X	Y_1	Y_2

f)

II. What conjecture (conclusion) can be made about comparing the equations algebraically, graphically, and numerically (table)?

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