**Curriculum Sample Template**
Max.8Pages

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|---|---|---|---|
| **Grade Level** | 9 | **Content Area** | Mathematics |
| **Course Title** (grades9-12Only) | Algebra I | | |
| **Expected Prior Knowledge**<br>*The knowledge/skills mastered earlier in the year foundational to the mastery of the required Standard in the current sample.* | Students are expected to have mastered the skill of solving systems of linear equations exactly and approximately (e.g., with graphs), focusing on pairs of linear equations in two variables. Also, 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). Explain why the x coordinates of the points where the graphs of the equations y = f(x) and y = g(x) intersect are the solutions of the equation f(x) = g(x); find the solutions approximately. | | |
| **Alignment to Program of Instruction**<br>*Briefly outline methods of instruction found in this sequence of lessons that align to the Program of Instruction described in A.3.* | As project based learning is a key feature in the school's mission, students will apply knowledge gained in math to complete projects and solve real world issues, and some may even be cross curricular. Lessons are aligned to both the program of instruction and common core standards by scaffolding knowledge, engaging students and requiring them to use higher depths of knowledge to demonstrate mastery and solve real world problems. | | |
| **Standard Number and Description**<br>*List the Number* and full description for the required Standard.* | A.REI.12<br>Graph the solutions to a linear inequality in two variables as a half-plane (excluding the boundary in the case of a strict inequality), and graph the solution set to a system of linear inequalities in two variables as the intersection of the corresponding half-planes. | | |
| **Materials/Resources Needed** | Ruler, paper, coloring utensils. | | |

****StandardNumber**:ForEnglishLanguageArts(ReadingandWriting),useGrade,Strand,Standard(e.g.,3.RI.2).ForK-8Math,useGrade,Domain,Standard(e.g.,6.EE.7).ForHSMath,useConceptualCategory-Domain,Standard(e.g.,A-REI.6).ForScience,useGrade,Strand,Concept,PO(e.g.,4.1.3.1).*

| **Lesson** (add as needed | **Instruction** | **Student Activities** |
|---|---|---|
| **1** | **Objective: SWBAT Graph the solutions to a linear inequality in two variables as a half-plane (excluding the boundary in the case of a strict inequality), and graph the solution set to a system of linear inequalities in two variables as the intersection of the corresponding half-planes.** Teacher will introduce the topic of graphing the solutions of a linear inequality with two variables by graphing half planes. Teacher instructs students to take notes in their math notebook. Students practice in class using specific worksheets which allow students to reinforce lesson. Teacher then facilitates students working with a partner to compare answers and review any inconsistencies between their answers/graphs, and collaborate together and ensure they are all getting the main idea. Teacher will then play class Trivia game in which teams work together to solve and graph problems written on the board, and will hold up answers/graphs on wipe off boards. Score is kept for points in class toward the assignment. | Students will learn and take notes on the topic of solving and graphing two variable inequalities on half planes, and also graphing the solution set as the intersection of the corresponding half-planes. Students then practice in class independently by completing a worksheet. Students then pair up with a partner, compare answers and graphs, and assist each other if any solutions or graphs are incorrect. Students then work together and use a wipe off board in a game in which they have a specific amount of time to solve and graph a problem. Students in the class hold up their wipe off boards at the same time, earning points for correct answers. |
| **2** | **Objective: SWBAT Graph the solutions to a linear inequality in two variables as a half-plane (excluding the boundary in the case of a strict inequality), and graph the solution set to a system of linear inequalities in two variables as the intersection of the corresponding half-planes.** Teacher instructs students to complete project/first summative assessment in which students design a work of abstract art by shading certain planes specific colors. Teacher instructs students to follow the prompt of creating 8 two variable linear inequalities and graphing their solutions on a half plane. Each equations should be written or shaded in a different color, which will be the color shaded in. Teacher will instruct students to also graph the intersection of two half planes. As more lines intersect and are shaded specific colors (decided by the student) an abstract piece of art will emerge. Students should be able to replicate this based on the colored equations on the back of the art piece. | Students will create an abstract piece of art as a summative assessment project. Students will first create 8 two variable equations, which they will be able to graph. Students should design intentionally as a piece of art, and should color each equation a specific color, the same color that will shade the half plane once the inequality is graphed. As more inequalities are graphed and shaded, an abstract piece of art will emerge. |

| | | |
|---|---|---|
| **3** | **Objective: SWBAT Graph the solutions to a linear inequality in two variables as a half-plane (excluding the boundary in the case of a strict inequality), and graph the solution set to a system of linear inequalities in two variables as the intersection of the corresponding half-planes.**<br><br>Teacher will distribute second summative assessment in which students write an extended response explaining in detail how to graph the solution to a linear inequality in two variables as a half plane, and graph and shade the two variables as half planes. Teacher will emphasize step by step instructions are required. | Students will complete an extended writing summative assessment during the entire class period. Students will write step by step instructions about how to graph the solution to a linear inequality in two variables as a half plane, and graph and shade the two variables as half planes. |
| **4** | **Objective: Based on the skills obtained in this unit, SWBAT take a summative assessment in which they solve and graph inequalities on a half plane.**<br>Teacher will distribute a written assessment as their third summative assessment. | Students will complete a written comprehensive summative assessment during the entire class period. |

***Paste Summative Assessment Here:***

## 1. *Abstract Art Project Rubric*

Directions: You will create an abstract piece of art as a summative assessment project. First create 8 two variable equations, which you will be able to graph. Design intentionally as a piece of art, and should color each equation a specific color, the same color that will shade the half plane once the inequality is graphed. As more inequalities are graphed and shaded, an abstract piece of art will emerge.

| Category | Level 4:<br>Achieves Standards at a High Level | Level 3:<br>Performance at Standard | Level 2:<br>Performance below Standard | Level 1:<br>Demonstrates Minimal Success |
|---|---|---|---|---|
| Accuracy of Plot | All points are plotted correctly and are easy to see. A ruler is used to neatly connect the points or make the bars, if not using a computerized graphing program. 25 points | All points are plotted correctly and are easy to see. 20 points. | All points are plotted correctly. 15 points. | Points are not plotted correctly OR extra points were included. 10 points |
| Replicability | Procedures appear to be replicable. Steps are outlined sequentially and are adequately detailed. 25 points. | Procedures appear to be replicable. Steps are outlines and are adequately detailed. 20 points. | All steps are outlined, but there is not enough detail to replicate procedures. 15 points. | Several steps are not outlined AND there is not enough detail to replicate procedures.10 points. |
| Shading | All planes are accurately shaded with the color associated with the inequality. 25 points. | 6-7 half planes are shaded accurately with the color associated with the inequality. 20 points. | 4-5 half planes are shaded accurately with the color associated with the inequality. 15 points. | 3 or less half planes are shaded accurately with the color associated with the inequality. 10 points |

***2. Extended Writing Assessment***

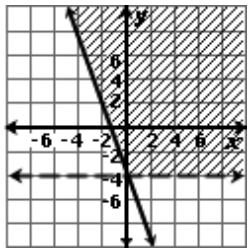
Directions: Write step by step instructions about how to graph the solution to a linear inequality in two variables as a half plane, and graph and shade the two variables as half planes. These should be explained in a manner in which a student not in this class could understand the instructions.

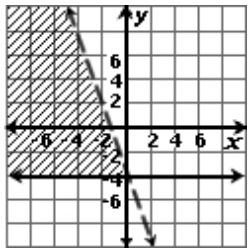
| Category | Level 4:<br>Achieves Standards at a High Level | Level 3:<br>Performance at Standard | Level 2:<br>Performance below Standard | Level 1:<br>Demonstrates Minimal Success |
|---|---|---|---|---|
| Mathematical Concepts | Explanation shows complete understanding of the mathematical concepts used to solve the problem(s). 25 points. | Explanation shows substantial understanding of the mathematical concepts used to solve the problem(s). 20 points | Explanation shows some understanding of the mathematical concepts needed to solve the problem(s). 15 points | Explanation shows very limited understanding of the underlying concepts needed to solve the problem(s) OR is not written. 10 points |
| Explanation | Explanation is detailed and clear. 25 points | Explanation is clear. 20 points | Explanation is a little difficult to understand, but includes critical components. 15 points | Explanation is difficult to understand and is missing several components OR was not included. 10 points |
| Strategy/ Procedures | Uses an efficient and effective strategy to solve the problem(s). 25 points | Uses an effective strategy to solve the problem(s). 20 points | Sometimes uses an effective strategy to solve problems, but does not do it consistently. 15 points | Rarely uses an effective strategy to solve problems. 10 points |
| Mathematical Terminology and Notation | Correct terminology and notation are always used, making it easy to understand what was done. 25 points | Correct terminology and notation are usually used, making it fairly easy to understand what was done. 20 points | Correct terminology and notation are used, but it is sometimes not easy to understand what was done. 15 points | There is little use, or a lot of inappropriate use, of terminology and notation. 10 points |

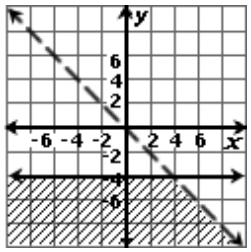
### *3. Written Comprehensive Assessment*

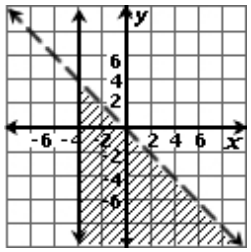
1. Which graph best represents the solution to this system of inequalities?

$$\begin{cases} y < -x \\ x \geq -4 \end{cases}$$

A. 

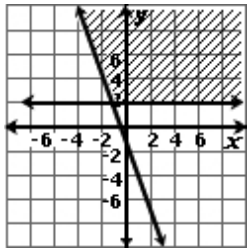
B. 

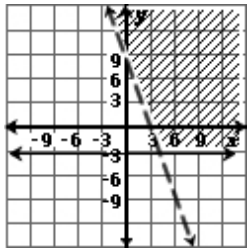
C. 

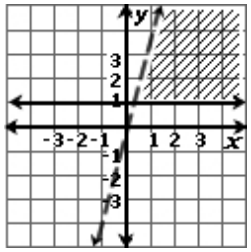
D. 

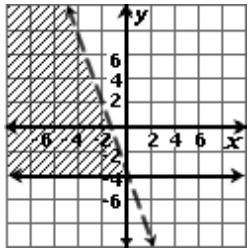
2. Which graph best represents the solution to this system of inequalities?

$$\begin{cases} y - 4x < 0 \\ y \geq 1 \end{cases}$$

A. 

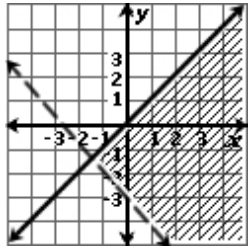
B. 

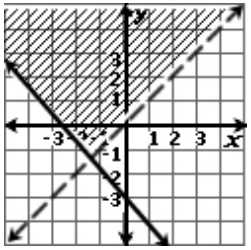
C. 

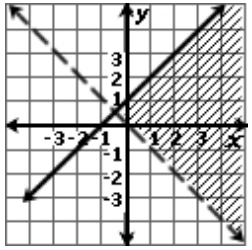
D. 

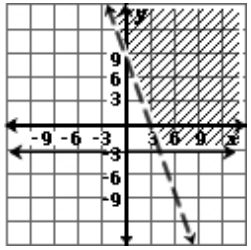
3. Which graph best represents the solution to this system of inequalities?

$$\begin{cases} x \geq -y \\ y < x + 1 \end{cases}$$

A. 

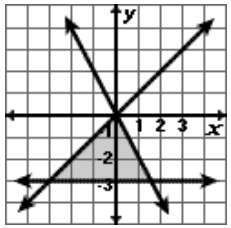

B. 

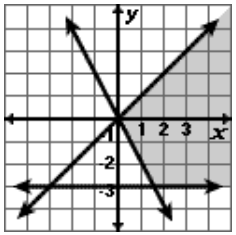

C. 

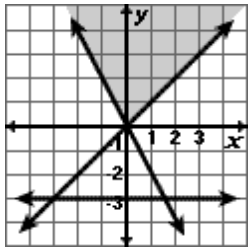

D. 

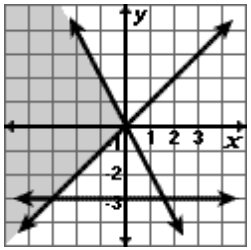

*4.* Which graph best represents the solution to this system of inequalities?

$$\begin{cases} y + 3 \geq 0 \\ y - x \leq 0 \\ y \geq -2x \end{cases}$$

A. 


B. 

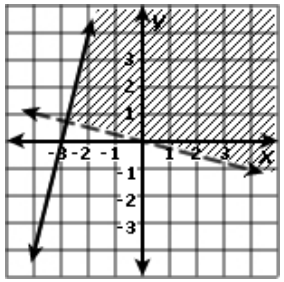

C. 


D. 

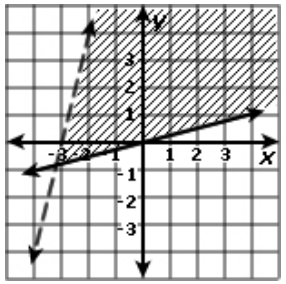
5. Which graph best represents the solution to this system of inequalities?

$$y \leq 4x + 12$$
$$y > -\frac{1}{4}x$$

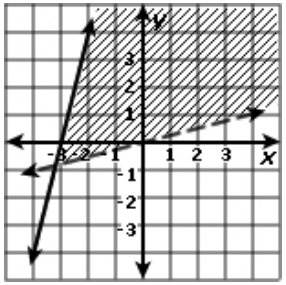
A.



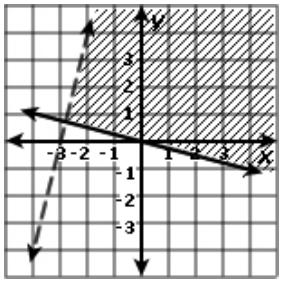

B.




C.




D.




Answer key: 1.A 2.C 3.C 4.B 5.D