**B. C. Rain High School Lesson Plans** Department: **Algebra 2/Trig** C.Mahoney 01/23 01/27

| **C.O. S. Standards and Objectives** | **ACT Standards and Objectives:** Same as COS | **Essential Questions:** |
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| *The student will be able to... The student will be able to* use matrices to represent and manipulate data, e.g., to represent payoffs or incidence relationships in a network. (*Use technology to approximate roots.)* [N-VM6];<br>(+) Multiply matrices by scalars to produce new matrices, e.g., as when all of the payoffs in a game are doubled. [N-VM7];<br>(+) Add, subtract, and multiply matrices of appropriate dimensions. [N-VM8];<br>(+) Understand that, unlike multiplication of numbers, matrix multiplication for square matrices is not a commutative operation, but still satisfies the associative and distributive properties. [NVM9];(+) Understand that<br>the zero and identity matrices play a role in matrix addition and multiplication similar to the role of 0 and 1 in the real numbers. The determinant of a square matrix is nonzero if and only if the matrix has a multiplicative inverse. [N-VM10];(+) Find the inverse of a matrix if it exists and use it to<br>solve systems of linear equations (using technology for matrices of dimension 3 × 3 or greater). [A-REI9]]Solve quadratic equations with real coefficients that have complex solutions. [N-CN7]<br>(+) Know the Fundamental Theorem of Algebra; show that it is true for quadratic polynomials. [N-CN9]<br>Create equations and inequalities in one variable and use them to solve problems. *Include equations arising from linear and quadratic functions, and simple rational and exponential functions*. [A-CED1]<br>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, e.g., using technology to graph the functions, make tables of values, or find successive approximations. Include cases where $f(x)$ and/or $g(x)$ are linear, polynomial, rational, absolute value, exponential, and logarithmic functions.* [A-REI11]<br>Create graphs of conic sections, including parabolas, hyperbolas, ellipses, circles, and degenerate conics, from second-degree equations. [AL]<br>Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes.* [F-IF5]<br>Graph functions expressed symbolically, and show key features of the graph, by hand in simple cases and using technology for more complicated cases.* [F-IF7]<br>Identify the effect on the graph of replacing $f(x)$ by $f(x) + k$, $k f(x)$, $f(kx)$, and $f(x + k)$ for<br>specific values of $k$ (both positive and negative); find the value of $k$ given the graphs. Experiment with cases and illustrate an explanation of the effects on the graph using technology. Include recognizing even and odd functions from their graphs and algebraic expressions for them. [F-BF3] | **Essential Vocabulary:**<br><br>Inverse matrices, **Identity matrix, inverse matrix, determinant**<br><br>DOK 2 and 3 | How do I find the determinant, identity matrix and inverse matrix ?<br>How do I use matrices to solve systems of three equations?<br>How do I apply matrices to solve problems?<br><br>**Questions to promote higher order thinking:**<br>Why?<br>How did you get your answer?<br>Does your answer seem reasonable? Why or why not?<br>Can you describe your method to us all? Can you explain why it works?<br>How did you reach that conclusion?<br>Can you think of a counterexample?<br>How would you prove that?<br>What assumptions are you making?<br>Why did you decide to use this method?<br>Can you think of another method that might have worked?<br>Is there a more efficient strategy?<br>Does anyone have the same answer, but a different way to explain it? |

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| **Mon 01/23** | **Lesson:** Matrix Review<br>**Activities and Materials:**<br>**Intervention**: ASPIRE bell ringer and review problems<br>**Before:** Review matrix operations, Check homework, homework Quiz<br>• **Bullying Presentation-Ms. Robinson** | **Assessment:**<br>Checking for Understanding-participation, teacher observation, guided practice, partner practice, homework check, **Assignment:** bell ringer |
| **Tues 01/24** | **Lesson: D**eterminant, identity matrix and inverse matrix<br>**Intervention**: ASPIRE bell ringer and review problems<br>**Before:** Review matrix operations<br>**During:** Notes/guided practice problem solving/partner collaboration: **D**eterminant, identity matrix and inverse matrix<br>**After:** Partners- problem set SpringBoard<br>page 60 #'s 7, 8, 9 page 61 Try These<br>Material**s Supplies**<br>Teacher: laptop, smart board, lesson plan<br>Student: notebook with paper, pencil, calculator, textbook, homework<br>**Modifications/ Accommodations**<br>Preferential Seating, additional verbal/visual prompts, use of calculator, pairing, small group, reteaching | Assessment<br>Checking for Understanding-participation, teacher observation, guided practice, partner practice, bell ringer, homework<br><br>Assignment<br>Bell ringer, review, notes<br>Partner activity/homework problem set SpringBoard<br>page 60 #'s 7, 8, 9 page 61 Try These |
| **Wed 01/25** | **Lesson: D**eterminant, identity matrix and inverse matrix<br>Activities and Materials:<br>**Intervention**: ASPIRE bell ringer and review problems<br>**Before**: Check homework<br>**During:** Notes/guided practice problem solving/partner collaboration: **D**eterminant, identity matrix and inverse matrix<br>**After:** Partners- inverse problem set, Cryptography Matrix Task<br>Material**s Supplies**<br>Teacher: laptop, smart board, lesson plan<br>Student: notebook with paper, pencil, calculator, textbook, homework<br>**Modifications/ Accommodations**<br>Preferential Seating, additional verbal/visual prompts, use of calculator, pairing, small group, reteaching | Assessment<br>Checking for Understanding-participation, teacher observation, guided practice, partner practice, bell ringer, homework, homework check,<br>Assignment<br>Bell ringer, review, notes<br>Partner activity/homework problem set inverse problem set, Cryptography Matrix Task |
| **Thu 01/26** | **Lesson:** Matrices to solve systems of 2 x 2 equations?<br>**Activities and Materials:**<br>**Intervention**: ASPIRE bell ringer and review problems<br>**Before**: Review/reteach matrix operations, homework quiz<br>**During:** Notes/guided practice with partner collaboration: problem solving: solving 2x2 systems<br>**After:** Partners: solve systems problem set solving 2x2 systems<br>Material**s Supplies**<br>Teacher: laptop, smart board, lesson plan<br>Student: notebook with paper, pencil, calculator, textbook, homework<br>**Modifications/ Accommodations**<br>Preferential Seating, additional verbal/visual prompts, use of calculator, pairing, small group, reteaching | **Assessment:**<br>Checking for Understanding-participation, teacher observation, guided practice, partner practice, homework check, Review quiz, problem set<br>**Assignment:** bell ringer, notes, quiz, partners problems set 2x2 systems |
| **Fri 01/27** | **Lesson:** Matrices to solve systems of three equations?<br>**Activities and Materials:**<br>**Intervention**: ASPIRE bell ringer and review problems<br>**Before**: Check homework, homework quiz<br>**During**: Notes/guided practice with partner collaboration: problem solving: use graphing calculators to solve systems<br>**After:** Partners: solve systems problem set solving 3X3 systems<br>Material**s Supplies**<br>Teacher: laptop, smart board, lesson plan<br>Student: notebook with paper, pencil, calculator, textbook, homework<br>**Modifications/ Accommodations**<br>Preferential Seating, additional verbal/visual prompts, use of calculator, pairing, small group, reteaching | **Assessment:**<br>Checking for Understanding-participation, teacher observation, guided practice, partner practice, homework check, Review quiz, problem set<br>**Assignment:**<br>bell ringer, notes, quiz, partners problems set 3x3 systems |