Lesson Context

BIG PICTURE of this UNIT:	• mastery with algebraic skills to be used in our work with co-ordinate geometry (midpoint, length, slope) • understanding various geometric properties of quadrilaterals & triangles • how do you really "prove" that something is "true"?

(A) **Lesson Objectives:**

a. Use Geogebra to investigate geometric properties of lines, circles, triangles and quadrilaterals

Lab 4 EXPLORATION ASSIGNMENT #1: Dynamic geometry software: Working with Geogebra

1. Show me an axes with a grid	5 pts
2. Show me that you can construct a line segment between 2 points and measure its length, slope and find its midpoint	5 pts
3. Show me that you can construct a line through two points & determine the slope and equation and the angle that it would make with the *x*-axis	5 pts
4. Show me that you can construct a triangle and measure the slope of each side and measure each angle and determine the area	5 pts
5. Show me you can reflect a rectangle across the *x*-axis and across the *y*-axis	5 pts
6. Show me that you can translate a parallelogram 3 units to the left and 6 units down	5 pts
7. Show me that you can construct a perpendicular bisector of a side of a triangle	5 pts
8. Show me that you can construct an angle bisector of an angle in a triangle	5 pts
9. Show me that you can construct a median (as a line segment) in a triangle	5 pts
10. Show me how to construct an altitude of a triangle	5 pts

Lab 4 EXPLORATION ASSIGNMENT #2: Working with Triangles & Quadrilaterals

(A) Use slopes to prove that ΔABC is a right triangle, given that $A(4,2)$, $B(-2,4)$, $C(2,-4)$	10 pts
(B) A triangle is enclosed by the lines $3x+13y=56$, $5x-8y=34$, $-8x-5y=-1$. Determine: i. the coordinates of the vertices and ii. the type of triangle (scalene, isosceles, equilateral) iii. its area	10 pts
(C) Construct a parallelogram, where 2 of the points MUST be (-2,5) and (-6,-3) i. Show me whether or not the diagonals BISECT each other? ii. Construct the midsegments of your parallelogram. Is the new quadrilateral also a parallelogram	10 pts
(D) Show me whether or not the diagonals of a rhombus are perpendicular bisectors of each other?	10 pts

Lab 4 EXPLORATION ASSIGNMENT #3 (EXTENSION): Triangle Centers (research required)

(A) Perform a construction to find the INCENTER in a triangle ➔ explain/construct significance	
(B) Perform a construction to find the CIRCUMCENTER in a triangle ➔ explain/construct significance	
(C) Perform a construction to find the CENTROID in a triangle.	
(D) Perform a construction to find the ORTHOCENTER in a triangle.	