IM2 Lab 1 - Coordinate Geometry Investigations with Geogebra

BIG PICTURE of this UNIT:	• mastery with linear algebraic skills to be used in our work with coordinate geometry (midpoint, length, slope) • understanding various geometric properties of quadrilaterals, triangles & circles • how do you really "prove" that something is "true"? • introduction to working with 3D shapes

EXPLORATION #1: Dynamic geometry software: Working with Geogebra

Show me an axes with a grid and that you can remove either/both the axes and the grid	5 pts
Show me that you can construct a line segment between 2 points and measure its length, slope and find its midpoint	5 pts
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
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
Show me you can reflect a rectangle across the x-axis and across the y-axis	5 pts
Show me that you can translate a parallelogram 3 units to the left and 6 units down	5 pts
Show me that you can construct a perpendicular bisector of a side of a triangle	5 pts
Show me that you can construct an angle bisector of an angle in a triangle	5 pts
Show me that you can construct a median (as a line segment) in a triangle	5 pts
Show me how to construct an altitude of a triangle	5 pts

EXPLORATION #2: Working with Triangles & Quadrilaterals

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

EXPLORATION #3 (EXTENSION): Triangle Centers (research required)

Perform a construction to find the INCENTER in a triangle explain/construct significance	
Perform a construction to find the CIRCUMCENTER in a triangle explain/construct significance	
Perform a construction to find the CENTROID in a triangle	
Perform a construction to find the ORTHOCENTER in a triangle	