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
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PART 1 – Skills INSTRUCTION – TI-84 GDC & DESMOS

- 1. Explain what a "linear system" is.
- 2. Use algebra to solve the linear system defined by y = 8 x and y = 3x 1.
- 3. We will use the TI-84 graphing calculator to solve the equation 8 x = 3x 1.
 - a. Use the Y= key and type into Y1= the equation y = 8 x.
 - b. Then use Y2= to enter the second linear equation y = 3x 1.
 - c. Go to the WINDOW key and set the Xmin to -10, Xmax to 10, Ymin to -10 and Ymax to 10
 - d. Hit the GRAPH key
 - e. Go to 2ND TRACE to access the CALC menu and scroll to option 5: intersect
 - f. Hit ENTER to acknowledge that your first curve is Y1 = 8 x and then hit ENTER again to acknowledge that your second curve is Y2 = 3x 1.
 - g. Now use the cursor keys to position the cursor near the intersection point and hit ENTER again.
 - h. Prepare a sketch in your notes of the two lines and their intersection point. The equations MUST be presented as must the intersection point.
- 4. Use the TI-84 to solve the following equations. Sketch your "solutions".
 - a. $-\frac{3}{4}x + 5 = -2$ b. 4x 8 = 15 c. 9 2x = -3x 1
- 5. Now, use the online graphing program called DESMOS at www.desmos.com and find the intersection points of the following linear systems:
 - a. 1 3x = x 7 b. $-\frac{7}{4}x 5 = -20$ c. 28 3x = 4x 15

PART 2 – Guided Skills PRACTICE – GEOGEBRA and Linear Equations

- 1. Use GEOGEBRA to plot the two points A(2,5) and B(6,-3).
- 2. Use GEOGEBRA to draw the line segment between A(2,5) and B(6,-3).
- 3. Use GEOGEBRA to calculate the length of the line segment AB. Explain how GEOGEBRA calculated the length of the segment as 8.94 units. (HINT: Draw the point (2,-3) into your diagram.)
- 4. Use GEOGEBRA to find the slope of the line through the points A(2,5) and B(6,-3).
- 5. Use GEOGEBRA to draw the line through the points A(2,5) and B(6,-3) and hence state the equation of the line through these points.
- 6. Use GEOGEBRA to draw the line through the point A(2,5) that is perpendicular to line AB.
- 7. Use GEOGEBRA to determine the slope of the line perpendicular to line AB.

PART 3 – Independent Skills PRACTICE – GEOGEBRA and Linear Equations and Coordinate Geometry

Use three points to construct the following triangle and determine:



- 1. the equations of the line (segments) that make up the sides of the triangle
- 2. the lengths of the each of the sides
- 3. the measure of each of the angles
- 4. the area of the triangle
- 5. **CHALLENGE**: Try part (1), (2) and (4) WITHOUT using GEOGEBRA!! (You will eventually be expected to do this anyway!!!)