## Varignon Polygons and Similar Regular Polygons

Your spring term project will be due on Friday May 8

We have studied the <u>Varignon Quadrilateral</u> – the quadrilateral whose vertices are made up of the midpoints of the sides of the outer quadrilateral. There are many interesting properties of the varignon quadrilateral.

In this project, you will look specifically at regular polygons and creating new polygons by connecting the midpoints of the sides. You will use GeoGebra to answer many questions about the polygons created. Some of the questions will be ones I ask and <u>one will be one that you ask.</u>

You will **create GeoGebra files and print them out and hand them in with the paper** that you write in order to show the work that you have done to justify your conclusions.

You will answer the questions on the rubric to the best of your ability.

You will **come up with one original research question** related to the same polygons on your own and answer that as well.

You will **include citations of websites or books** that you use to gain any outside information (or from people). You may use Chicago, APA, or MLA styles of reference citation. (See Moodle)

Please see the rubric on the opposite side of this sheet for questions that you are required to answer.

The paper must also **include** <u>an introduction and a conclusion</u> discussing your purpose for this project and synthesizing any conclusions that your have drawn or proven in the project.

The minimum length of the paper is 3 pages and 1 page of references (if any are used). The 3 pages do not include your GeoGebra diagrams.

If desired, you can use GeoGebra to look for different types of functions to do the analysis of the first major question for the project. I am happy to help anyone who is interested in doing this part of the project. The pdf file found at the following link is very helpful with this part of the project (not necessary to cite).

## http://www.geogebra.org/en/upload/files/Norwegian/Jon\_Arild\_Jorgensen/Regression%20curves%20and %20GeoGebra.pdf

It is expected that you will do this project on your own. Any collaboration with other students, parents or teachers will be considered academic dishonesty. Please let me know at any time if you have questions about the work.

If you choose to make your eBook for presentation:

- You can use your iPad or Mac (Book Creator or iBooks Author)
- We will have time in class where I am available for help to work with these apps if you would like



Questions/Tasks	Satisfactory (1-4 pts.)	Very Good (5-7 pts.)	Superior (8-10 pts.)
What is the relationship between	Polygons and Areas are	You have gone	You have taken your
the area of a regular polygon with	constructed and	beyond the	analysis one step further by
"n" sides and the area of the	calculated ratios are	Satisfactory level and	looking for a function that
Varignon regular polygon made up	calculated.	show evidence of	could describe the ratio of
of vertices of the sides of the outer	Commentary on your	looking for patterns	the area of the Varignon
regular polygon?	methods and ideas are	in the relationships	Polygon to the outer
	written in the paper.	between the areas,	polygon. You have detailed
$\frown$		written about them	analysis of this and
		and drawn some	justification of the work you
		conclusions about	have done. Your work is
		the areas of the inner	clear and easily discernable
		and outer regular	by the reader.
		polygons	
Construct a graph of the number	Your graph is on graph	Your graph is done	Your graph is done in
of sides of a polyaon vs. the ratio	paper and you state	electronically and	conjunction with the
of the areas (Varianon vs. outer)	what you observe.	you think about the	function that you have
and do some analysis	,	structure and	found and initiates
,		behavior of the graph	discussion in the paper that
		in relation to what is	connects your visualization
		happening as the	of the graph with your
		number of sides	understanding of the
		increases	function itself.
You must think of another	You create a question	You create an	You create an interesting
interesting question about these	very similar to the one I	interesting	exploration question, use
polygons and analyze it using	created and only using	exploration question	GeoGebra in creative ways
GeoGebra.	GeoGebra as a drawing	and find ways to use	to investigate your theory
	tool. Little writing is in	GeoGebra to	and write thorough
	the paper.	investigate it. You	justification or proof in your
		write a substantial	paper to show that your
		amount in the paper	conjecture was true.
		but are unable to	
		prove your theory.	
Presentation of your paper/project	You hand in a 3 page	You hand in a 3-4 page	Your project includes an extensive
	paper with your	paper with an eBook of	well-written paper and also a
	GeoGebra diagrams.	GeoGebra diagrams	shows your thought process and
		with descriptions of	analysis with your GeoGebra files.
		the paper.	