Summative Assessment

Standards:

MA3A13 Students will explore polar equations

a. express coordinates of points in rectangular and polar form

b. graph and identify characteristics of simple polar equations including lines, circles,

cardioids, limacons, and roses

Required Materials:

Access to computer for [www.desmos.com](http://www.desmos.com)

**Part 1:**

1. Your friend gives you directions to his house beginning at the end of your driveway. He tells you to go 8 miles east, then 10 miles south. Describe to a family member where you will be only using one step.

*i.e 8 miles east is one step, 10 miles south is the second.*

2. A friend tells you to meet him downtown for dinner. He tells you that from the starbucks on Broad street the restaurant is 5 miles perfectly north-west. You obviously cannot walk through walls so you must travel along the streets which lie vertically and horizontally. In two steps tell how you would meet your friend.

3. Provide a brief description of the four polar curves we investigated. In addition discuss the relationships you see between the four.

4. Think back to day one of this unit. I asked which plane you would choose to do your mathematics in. After spending more time familiarizing yourself with the polar plane, determine if your decision is the same. Tell me which one you chose on day one and which one you would choose now. Provide support for your decision.

**Part 2**

Recall the graph gallery that we saw in the instructional video for desmos.com. The second portion of your assessment is to combine your mathematical expertise and knowledge of the polar plane with your creativity to produce a picture of your own.

Design requirements:

- You must use at least two different types of polar curves from the ones we investigated.

(circles, roses, limacons, and cardioids)

- Beyond these curves, you may use whatever mathematical functions you would like

- Be creative and make visually appealing (use color please☺)

After creating your design:

1. Write equations for 7 of your functions. (The four polar curves are required; the other three are your choice)

answers will vary depending on student design

2. Reflect on your design process. How and why did you choose the functions you used?

answers will vary

Bonus:

If time permits, try and write three of your non-polar functions from, in polar form. Show work below.

Answers will vary

Sample picture graph:

