Honors Activity- 6.06 Part C Template

All responses must be typed onto this document. Handwritten responses will not be accepted.

For this activity, consider that you are in the landscaping consultant business for a company PythagoGrass.

You have landed some important clients who want some work done in their backyard. Follow the instructions to meet your client's requests.

Part C Instructions

1. **Understanding:** Two pillars have been delivered for the support of a shade structure in the backyard. They are both 10 feet tall, but unfortunately the makers of the pillars did not create the same-shaped pillars. In two to three sentences, describe steps you can take to determine whether the pillars have the same volume.

The shape of the bases must first be defined: circular, square, triangular, hexagonal, ect. For the cylinder or prism that suits the shape, find the formula. Then measure the bases to get the numbers needed for the formulas. So, that the base and height areas can be calculated. Plug in the numbers and solve for the results.

2. **Design:** Your client wants you to design a spherical fountain for a new garden bed. It is hard to find a manufacturer that can create perfect curved surfaces. You will need to modify the sphere to a series of cylindrical slabs with gradually decreasing radii.

Materials Needed: You will need graph paper, a compass, a ruler or tape measure, and a calculator.

Let's design the ideal fountain.

- Choose a radius for your fountain. Using this radius value, calculate the volume of your sphere
- Radius = 9

Show all steps of you work: **Volume = 4/3 Π r^3**

V = 4/3(3.14) 9^3

V = (4(3.14)(9^3))/3

V = (4(3.14)(729)/3

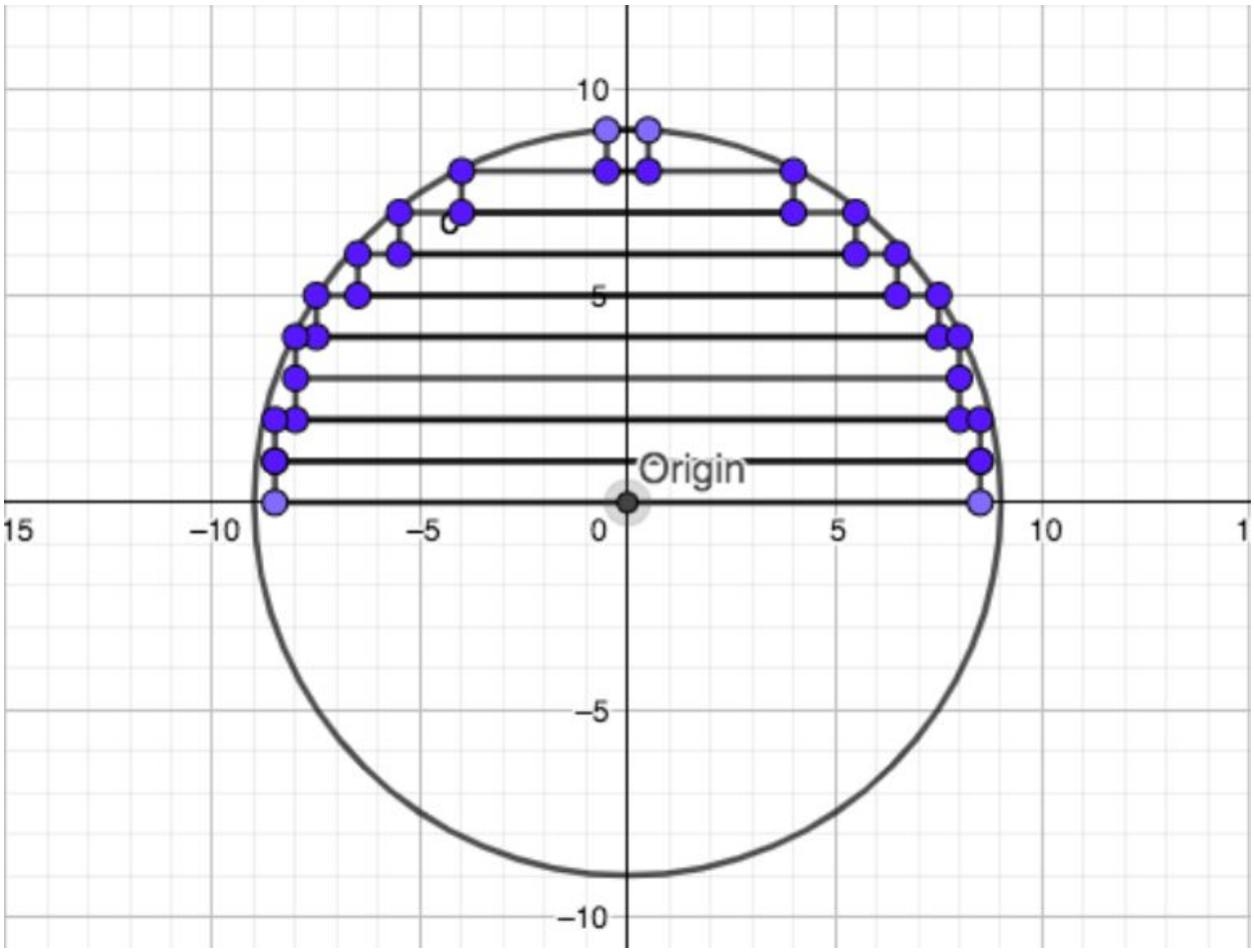
V = ((3.14)2916)/3

V =9156.24/3

V = 3052.08

Let's design the actual fountain.

- For our physical spherical fountain, we will take our original sphere diagram and create slabs.
- Starting at the x-axis, create stacks of slabs along the height of the hemisphere until you reach the top. Use your graph to make sure the height of each slab slice is the same.



Use geogebra.com to complete your graph, then copy/paste into this area
Click here for a video on how to use geogebra.com

- Notice that the slabs created will be short cylinders of varying radii but of equal heights. Use the graph to estimate the radius of each slab.

  Work Space: Show all work and calculations.

Using the volume formula for a cylinder of $\pi R^2 \cdot h$, calculate the volume of each cylindrical slab:

(3.14)1^2 times 1 = 3.14

(3.14)4^2 times 1 = 50.24

(3.14)5.5^2 times 1 = 94.985

(3.14)6.5^2 times 1 = 132.665

(3.14)7.5^2 times 1 = 176.625

(3.14)8^2 times 1 = 200.96

(3.14)8^2 times 1 = 200.96

(3.14)8.5^2 times 1 = 226.865

Add the slabs together, then multiply by 2 to represent BOTH halves of the sphere:

1,086.44 times 2 = 2,172.88

1. **Reflect:** Why was the volume of your fountain smaller than the volume of the ideal sphere? Discuss a more accurate method for approximating the volume of the spherical slab other than using just cylindrical slabs. Discuss in two to three sentences.

Because I used the cylindrical

Honors Segment Two Activity Part C Rubric

Category	Excellent	Good	Satisfactory	Needs Improvement
Diagram	**5 points** **All** of the elements of the diagram were present on graph paper, including the axes, labeled origin, labeled radius, sphere, and graduated slabs.	**4–3 points** **Most** of the elements of the diagram were present on graph paper, including the axes, labeled origin, labeled radius, sphere, and graduated slabs.	**2 points** **Some** of the elements of the diagram were present on graph paper, including the axes, labeled origin, labeled radius, sphere, and graduated slabs.	**1–0 points** **Few or none** of the elements of the diagram were present on graph paper, including the axes, labeled origin, labeled radius, sphere, and graduated slabs.
Calculations	**5 points** **All** of the volume calculations for both parts were presented in a typed manner and were accurate.	**4–3 points** **Most** of the volume calculations for both parts were presented in a typed manner and were accurate.	**2 points** **Some** of the volume calculations for both parts were presented in a typed manner and were accurate.	**1–0 points** **Few or none** of the volume calculations for both parts were presented in a typed manner and were accurate.
Written Responses	**10 points** **All** of the written responses included accurate and clear methods addressing the topic with a minimum of two sentences each.	**9–7 points** **Most** of the written responses included accurate and clear methods addressing the topic with a minimum of two sentences each.	**6–5 points** **Some** of the written responses included accurate and clear methods addressing the topic with a minimum of two sentences each.	**4–0 points** **Few or none** of the written responses included accurate and clear methods addressing the topic with a minimum of two sentences each.