

Math 12: Project Volume

Due Wednesday March 11

Introduction

With our understanding of integration we are now prepared to apply this knowledge to solving problems. In this project you will be computing the volume of an object that you find within the Mead art museum. The art museum has kindly agreed to aid us in working with the art and will be present to assist us. **Under no circumstances are you to touch any of the works at the museum.**

- **Wednesday Feb 25** We will go meet in the Mead Art Museum at 11am to obtain data for the objects. The museum has arranged for several staff members to take the actual measurements that you request. Remember that bags are not allowed in the museum and must be checked at the door, so allow ample time to get through this process. We will meet in the lobby of the museum and Susan Anderson will give a brief introduction before we begin.

Goals

1. Be able to compute the volume of an object that is symmetrical with respect to rotation.
2. Identify where these symmetrical objects occur in everyday life.
3. Be able to clearly present a mathematical report.

Assignment

1. Find an object in Mead Art Museum that can be described as a curve rotated about an axis.
2. Write an equation that describes the curve and compute the volume of the object.
3. Write a report consisting of a brief description/history of the object, the measurements taken at the museum (with diagram), the equation of the curve, and the total volume of the object. This is to include all mathematical calculations that you perform.

Rules for working with the art

We will be hosted by the art museum staff during regular class time, where you will be assisted in learning about the art and obtaining data. **Under no circumstance are you to touch any of the works at the museum.** To prevent accidental damage, a good rule is to come no closer than 6" to any of the works. The staff will be glad to help you obtain your data. Be sure to bring a pencil as pens are not permitted in the museum.

Checklist for Your Writing Projects

Based on checklists by Annalisa Crannell at Franklin & Marshall and Tommy Ratliff at Wheaton College.

Does this paper:

1. clearly (re)state the problem to be solved?
2. provide an explanation as to how the problem will be approached?
3. state the answer in a few complete sentences which stand on their own?
4. give a precise and well-organized explanation of how the answer was found?
5. clearly label diagrams, tables, graphs, or other visual representations of the math?
6. define all variables, terminology, and notation used?
7. clearly state the assumptions which underlie the formulas and theorems, and explain how each formula or theorem is derived, or where it can be found?
8. give acknowledgment where it is due?
9. use correct spelling, grammar, and punctuation?
10. contain correct mathematics?
11. solve the questions that were originally asked?

Grading

This project is worth 5% of your final grade and will be graded out of 25 points.