# THORNLIE S E N I O R H I G H S C H O O L

# MathematicS METHODS (y12)

# INVESTIGATION 1, SEM. 1 2022

“Designing a Logo”

Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_ Marks:  ***/30***

**SCHOOL LOGO**

**Due DATE: 2nd May**

**Objective:**

You have the task of designing a logo to represent a well-known organisation. The organisation is in the midst of redesigning their logo to rebrand their corporate image.

**Process:**

Drawing on your knowledge of calculus, areas between curves and understanding of various functions, you have to:

* Develop an area function which can be used to represent your logo design.
* Design a logo that is visually appealing and representative of the organisation’s image.
* Include practical considerations in mounting the logo on top of a sky scraper that is 230 m high in the central business district, i.e. consider the visibility of the logo from afar.
* Determine the total area of the logo.
* Create a drawing of the graph that represents the area function of the logo.
* The area function can include any functions you have studied before as well as those you have not encountered before, including but not limited to those below:
  + Polynomial functions
  + Trigonometric functions
  + Reciprocal functions
  + Functions involving

**Product:**

You have to submit **a written report** to communicate the basis of your logo design as well as the mathematics behind the design.

Please refer to the rubric (next page) on how you could structure your report and how it will be assessed.

All work submitted must be original. Plagiarism and copying another student’s work will result in severe penalty, including a zero mark for this assessment.

Late submission will incur a penalty of 10% for each day past the scheduled due date.

**Report Rubric:**

|  |  |
| --- | --- |
| Introduction and Assumptions  Out of 5 marks | * Clarifies the problem / task * Conducts and summarises research to investigate logos and trademark from various brands * Explains the background of the organisation you are representing * States assumptions that you will consider when embarking on the logo design process |
| Mathematical content  Out of 5 marks | * Considers the use of various functions when designing the logo * Includes the use of functions that are not polynomial functions in the logo design * Ability to incorporate functions that are ‘new’ * Develops an area function to represent the logo design * Considers how the area function you have developed is able to create a logo that effectively represents your organisation |
| Calculations and Results  Out of 6 marks | * Uses the area function correctly to determine the area of the logo * Dimensions of the logo are suitable for the practical requirements of the situation * Uses the relevant units of measurement * Considers the visibility of the logo from afar |
| Diagrams, graphs, illustrations  Out of 6 marks | * Preliminary sketches/references to various logos * Graphs are correctly plotted with relevant labels * Snapshots of diagrams for individual parts * Individual sections of areas identified (shaded) in calculations * Use of scale and final scaled diagram |
| Communicati  Out of 4 marks  on | * Uses diagrams and illustrations effectively to communicate ideas * Ideas are presented logically * Report is written coherently with well written sentence structures * Uses appropriate mathematical language * Format of the report is well structured and easy to read * Bibliography is included ? |
| Discussion and Conclusion  Out of 4 marks | * Summarise findings using language relevant to the original problem * Evaluates the processes taken to conduct this investigation and gives recommendations on how to improve the processes * Explains limitations to final design/Mathematical processes |

Total marks available: 30

PLEASE PRINT OR REPRODUCE THE BOX BELOW AND INSERT INTO YOUR REPORT:

**I \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ declare that the following task is my own work and that I have fully acknowledged in my bibliography both print and non-print sources for my ideas, vocabulary and information used in my arguments. I recognise that plagiarism is a serious matter which will be treated as cheating and penalised accordingly.**

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Introduction and Assumptions | Clarifies the problem/task | | Core business/ background of organisation | | | How Logo design reflects the core business | | Assumptions (2) | | | | | |
|  | |  | | |  | |  | | | | | |
| Mathematical content | Polynomial functions | | Exponential Reciprocal  Trigonometric | | | ‘New’ functions Circle, Square root, Quartic | | Considers effectiveness of various combinations of functions | | | | States/shows method used to find Areas | |
|  | |  | | |  | |  | | | |  | |
| Calculations & Results | Calculations of points of Intersections | Area functions for each section stated | | | Boundaries stated for each area function | | Calculates area of each part/section | | Total Area of Logo stated | | | | Dimensions of Logo |
|  |  | | |  | |  | |  | | | |  |
| Diagrams, Illustrations, Graphs | Preliminary sketches/references to various logos | Labels on each diagram/ graph | | | Snapshots of diagrams for individual sections | | Shading of individual sections of areas for calculations | | Scale used | | | | Final scaled diagram of Logo |
|  |  | | |  | |  | |  | | | |  |
| Communication | Use of diagrams/illustrations to communicate ideas | | | Ideas presented logically | | | Use appropriate mathematical language | | | Format of report well structured and easy to read | | | |
|  | | |  | | |  | | |  | | | |
| Discussion & Conclusion | Summarise findings using language relevant to original problem | | | Explains limitations to final design | | | Recommendations to improve the processes/ logo design | | | Compares with existing logos - research | | | |
|  | | |  | | |  | | |  | | | |
| Total Marks  \_\_\_\_\_\_\_\_\_\_\_\_\_ / 30 | | | |