** Mathematics Assignment 5**

**Stained Glass Design**

**Date:** Due

**Overview:**

People have been making stained glass designs for thousands of years. Beautiful windows and artwork have been created using stained glass.

**Preparation Work and Tasks:**

1. Use centimeter grid paper to sketch a design for a stained glass window. Use various sizes of circles, semicircles, and other shapes in your design. Number each piece in your design.
2. Each piece of stained glass needs a border. Usually these are made of metal such as copper or lead. Use string and a ruler to measure the diameter and circumference of each circle in your design. Estimate the length of metal needed to go around each shape. Record your estimates on the chart.
3. Calculate the actual circumference of each circle in your design. Use the formula C = (pi)d. Record your results on the chart.
4. Calculate the perimeter of all the other figures in your design. Record your measurements on the chart.
5. Estimate the area of each shape. Record your estimates on the chart.
6. Calculate the area of each figure in your design. Use the formula A = (pi)r2. Record your results on the chart.
7. Investigate the price of glass and the metal border material used to connect the glass. Calculate the cost of your design.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **#** | **Perimeter or Circumference****Estimate (cm)** | **Perimeter or Circumference****Actual (cm)** | **Area****Estimate****(cm2)** | **Area****Actual****(cm2)** | **Cost Metal****Border****$0.15/cm** | **Cost of****Glass****$0.10/cm** | **Total****Cost** |
| 1 |  |  |  |  |  |  |  |
| 2 |  |  |  |  |  |  |  |
| 3 |  |  |  |  |  |  |  |
| 4 |  |  |  |  |  |  |  |
| 5 |  |  |  |  |  |  |  |
| 6 |  |  |  |  |  |  |  |
| 7 |  |  |  |  |  |  |  |
| 8 |  |  |  |  |  |  |  |
| 9 |  |  |  |  |  |  |  |
| 10 |  |  |  |  |  |  |  |

**Evaluation:**

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| --- | --- | --- | --- | --- | --- |
| **Category** | **Level 4** | **Level 3** | **Level 2** | **Level 1** | **%** |
| Depth of Understanding | Demonstrates thorough understanding of concepts. | Demonstrates considerable understanding of concepts. |  |  | 20 |
| Problem Solving / Thinking | Use of procedure includes almost no errors or omissions. | Use of procedures is mostly correct, but there may be a few minor errors and / or omissions. |  |  | 20 |
| Application of Learning | Demonstrates sophisticated ability to make connections between mathematics learning and the real world. | Demonstrates considerable ability to make connections between mathematics learning and the real world. |  |  | 20 |
| Explanation and Justification of Concepts, Procedures, and Problem Solving | Provides thorough, clear and insightful explanations / justifications, using a range of words, pictures, symbols, and / or numbers. | Provides complete, clear and logical explanations / justifications, using appropriate words, pictures, symbols, and / or numbers. |  |  | 20 |
| Use of Mathematical Vocabulary | Uses a broad range of mathematical vocabulary to communicate clearly and precisely. | Uses mathematical vocabulary with considerable clarity and precision. |  |  | 20 |