** Mathematics Assignment 7**

**Orienteering**

**Date:** Due

**Overview:**

You will plan a cross-country orienteering route on a planning map using a Cartesian coordinate system. Then you will create map directions to describe your orienteering route. The map directions will state the coordinates for the start, and descriptions of transformations from the start to the finish through the control points. The descriptions will identify locations only, not routes.

**Preparation Work and Tasks:**

1. Draw a Cartesian coordinate grid to start your planning map. Choose and record the scale on your map.
2. Mark a point for the start. Label it and record its coordinates on your planning map and on your list of map directions.
3. Mark the first control point on your planning map. Label it and record its coordinates. In your map directions, write the translation vector to translate the starting point to the first control point.

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| **Map Directions** |  |
| Start | (3,4) |
| First control point | Translation Vector [-4,2] |

1. In your map directions, write a translation vector to translate the first control point to the second. Mark the second control point on your planning map.
2. In your map directions, describe a reflection in the x-axis or y-axis to reflect the second control point to the third. Mark the third control point on your planning map.
3. Describe a rotation of 90°, 180°, or 270° cw or ccw about the origin to rotate the third control point to the fourth. Mark the fourth control point on your planning map.
4. Repeat step F for a different rotation to move the fourth control point to the fifth.
5. Describe another reflection or rotation to move the fifth control point to the sixth.
6. Plan the point for the finish. The finish should be near the start. The last (seventh) control point should be near the finish. Use translations, reflections, or rotations to move the sixth control point to the seventh, and to move the seventh control point to the finish. Mark the seventh control point and the finish on your planning map.

**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 |