Honors Geometry  
Unit 12, Day 1

Introduction to Transformations – Notes

I. A **transformation** is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

\*The original figure is called the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

\*The transformed figure is called the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

II. There are four types of transformations:

1. **Translation**: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

2. **Dilation**: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

3. **Reflection**: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

4. **Rotation**: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

III. More About Translations

1. If , then translate it 5 units right and 3 units down.

|  |  |
| --- | --- |
| Algebraically | Using Matrices |
|  |  |

Graph:

2. If , then translate it 2 units left and 4 units up.

|  |  |
| --- | --- |
| Algebraically | Using Matrices |
|  |  |

Graph:

IV. More About Dilations

3. If , then dilate it by a factor of 2.

|  |  |
| --- | --- |
| Algebraically | Using Matrices |
|  |  |

Graph:

4. If quadrilateral, then dilate it by a factor of ½.

|  |  |
| --- | --- |
| Algebraically | Using Matrices |
|  |  |

Graph:

V. More About Reflections

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Across y-axis** | **Across x-axis** | **Across y=x** | **Across y=-x** |
| **Algebraic Rule** |  |  |  |  |
| **Matrix Rule** |  |  |  |  |

5. If , then reflect it across the y-axis.

|  |  |
| --- | --- |
| Algebraically | Using Matrices |
|  |  |

Graph:

6. If , then reflect it across y=-x.

|  |  |
| --- | --- |
| Algebraically | Using Matrices |
|  |  |

Graph:

VI. More About Rotations – counterclockwise about the origin!

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **90 degrees** | **180 degrees** | **270 degrees** | **360 degrees** |
| **Algebraic Rule** |  |  |  |  |
| **Matrix Rule** |  |  |  |  |

7. If , then rotate it 270 degrees.

|  |  |
| --- | --- |
| Algebraically | Using Matrices |
|  |  |

Graph:

8. If , then rotate it 90 degrees.

|  |  |
| --- | --- |
| Algebraically | Using Matrices |
|  |  |

Graph: