Guided Notes (Model Notes)

# Vocabulary

* **transformation:** a function (rule) that changes the figure in some way
* **translation:** a type of transformation where every point of a figure is moved the same distance in the same direction; the figure **slides** without rotating or flipping
* **preimage:** the original figure, before any transformation(s); the input
* **image:** the final figure; the result from applying the transformation(s); the output
* **rigid motion:** a transformation where the image is congruent to the preimage; a translation is an example of rigid motion

|  | Verbal Description |
| --- | --- |
| Translate the preimage 4 units right  and 2 units down. |
| Algebraic Rule |
|  |
| Mapping Notation | |
| ***Read:*** *Point A maps to point A prime.* | ***Read:*** *Polygon A, B, C, D maps to polygon  A prime, B prime, C prime, D prime.* |

* **vector:** a path, with a starting and ending point, that a figure follows; it has size (magnitude/distance) and direction
  + **example:** , read “vector *MN*,” where *M* is the starting (initial) point and *N* is the ending (terminal) point

|  |  |
| --- | --- |
|  | We can also represent in its component form: , where 4 is the horizontal component, and –2 is the vertical component. |

# Example Problems

**1)** Complete the table below for the unshaded preimage and shaded image.

| Graph | Verbal Description | | Algebraic Rule | Vector Notation | |
| --- | --- | --- | --- | --- | --- |
|  | Translate the preimage right 7 units and up 4 units. | |  |  | |
| **2)**  has the following vertices: , , , , and . Draw , then translate  using the vector . Label  and its image. | |  | | |

A picture containing transport, satellite, table, worktable

Description automatically generated**3)** What if the preimage was not on the coordinate plane? How would we construct the image? Construct the image given the following preimage and vector.

Guided Notes (Teacher Guide)

# Example 3

How to construct a translation with a compass and straightedge.

| Construction | Instruction |
| --- | --- |
|  | **Step 1:** Use the compass to measure the length of the vector. |
| Shape  Description automatically generated | **Step 2:** Use that measurement as the radius to construct an arc for each point (in the general direction that the vector is pointing). *Consider labeling each arc to keep track of which one corresponds to which point.* |
|  | **Step 3:** Use the compass to measure the distance between  and the initial end of the vector. This measurement tells us the distance between  and the terminal end of the vector. |
| Shape  Description automatically generated | **Step 4:** Use this measurement to construct an arc with a center at the terminal end of the vector and intersects the initial corresponding arc from Step 2. Label that point of intersection . |
| A picture containing transport  Description automatically generated | **Step 5:** Repeat steps 3 and 4 for the remaining points. |
| A picture containing transport, satellite, table, worktable  Description automatically generated | **Step 6:** Use a straightedge to create the polygon (image). |