Section 8.2 Translations

**Objective 1: Find Translation Images of Figures**

A **translation** is a transformation that maps all points of a figure the same distance in the same direction. A translation is an isometry.



 

Each point of square *ABCD* in the figure below moves 4 units right and 2 units down. Using ordered pair notation, we say each point  in the original figure is mapped to the point  where  and . We will use mapping notation to write this translation rule as .



a. Use the graph of  and the translation rule  to find the coordinates of the image of each vertex as an ordered pair and then graph the image.



b. Write an ordered pair translation rule for the figure shown.

 

c. Use the ordered pair translation rule  to find each of the following:

 i. the image of the origin.

 ii. the preimage of .

d. has coordinates , , and . A translation maps point *M* to . What are the coordinates of the other two vertices of the image?

A **composition of transformations** is a combination of two or more transformations. In a composition, we perform each transformation on the image of the preceding transformation.

e. Rosie is visiting a large city. From her hotel, she walks 3 blocks east and 4 blocks north to a coffee shop. Then she walks 7 blocks west and 1 block north to a museum. Where is the museum in relation to her hotel?

f. Find a single translation that has the same effect as the composition of translations  followed by .