## Unit 6 Lesson 2: Transformations as Functions

### 1 Math Talk: Transforming a Point (Warm up)

#### Student Task Statement

Mentally find the coordinates of the image of $A$ under each transformation.



* Translate $A$ by the directed line segment from $(0,0)$ to $(0,2)$.
* Translate $A$ by the directed line segment from $(0,0)$ to $(-4,0)$.
* Reflect $A$ across the $x$-axis.
* Rotate $A$ 180 degrees clockwise using the origin as a center.

### 2 Inputs and Outputs

#### Student Task Statement



1. For each point $(x,y)$, find its image under the transformation $(x+12,y−2)$.
	1. $A=(-10,5)$
	2. $B=(-4,9)$
	3. $C=(-2,6)$
2. Next, sketch triangle $ABC$ and its image on the grid. What transformation is $(x,y)\rightarrow (x+12,y−2)$?
3. For each point $(x,y)$ in the table, find $(2x,2y)$.

|  |  |
| --- | --- |
| * $(x,y)$
 | * $(2x,2y)$
 |
| * $(-1,-3)$
 | *
 |
| * $(-1,1)$
 | *
 |
| * $(5,1)$
 | *
 |
| * $(5,-3)$
 | *
 |

1. Next, sketch the original figure (the $(x,y)$ column) and image (the ($2x,2y)$ column). What transformation is $(x,y)\rightarrow (2x,2y)$?

### 3 What Does it Do?

#### Student Task Statement



1. Here are some transformation rules. Apply each rule to quadrilateral $ABCD$ and graph the resulting image. Then describe the transformation.
	1. Label this transformation $Q$: $(x,y)\rightarrow (2x,y)$
	2. Label this transformation $R$: $(x,y)\rightarrow (x,-y)$
	3. Label this transformation $S$: $(x,y)\rightarrow (y,-x)$



© CC BY 2019 by Illustrative Mathematics®