## 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 $\left(0,0\right)$ to $\left(0,2\right)$.
* Translate $A$ by the directed line segment from $\left(0,0\right)$ to $\left(-4,0\right)$.
* 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 $\left(x,y\right)$, find its image under the transformation $\left(x+12,y−2\right)$.
	1. $A=\left(-10,5\right)$
	2. $B=\left(-4,9\right)$
	3. $C=\left(-2,6\right)$
2. Next, sketch triangle $ABC$ and its image on the grid. What transformation is $\left(x,y\right)\rightarrow \left(x+12,y−2\right)$?
3. For each point $\left(x,y\right)$ in the table, find $\left(2x,2y\right)$.

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

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

### 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 $Q$: $\left(x,y\right)\rightarrow \left(2x,y\right)$
	2. Label this transformation $R$: $\left(x,y\right)\rightarrow \left(x,-y\right)$
	3. Label this transformation $S$: $\left(x,y\right)\rightarrow \left(y,-x\right)$



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