## Unit 6 Lesson 11: Perpendicular Lines in the Plane

### 1 Revisiting Transformations (Warm up)

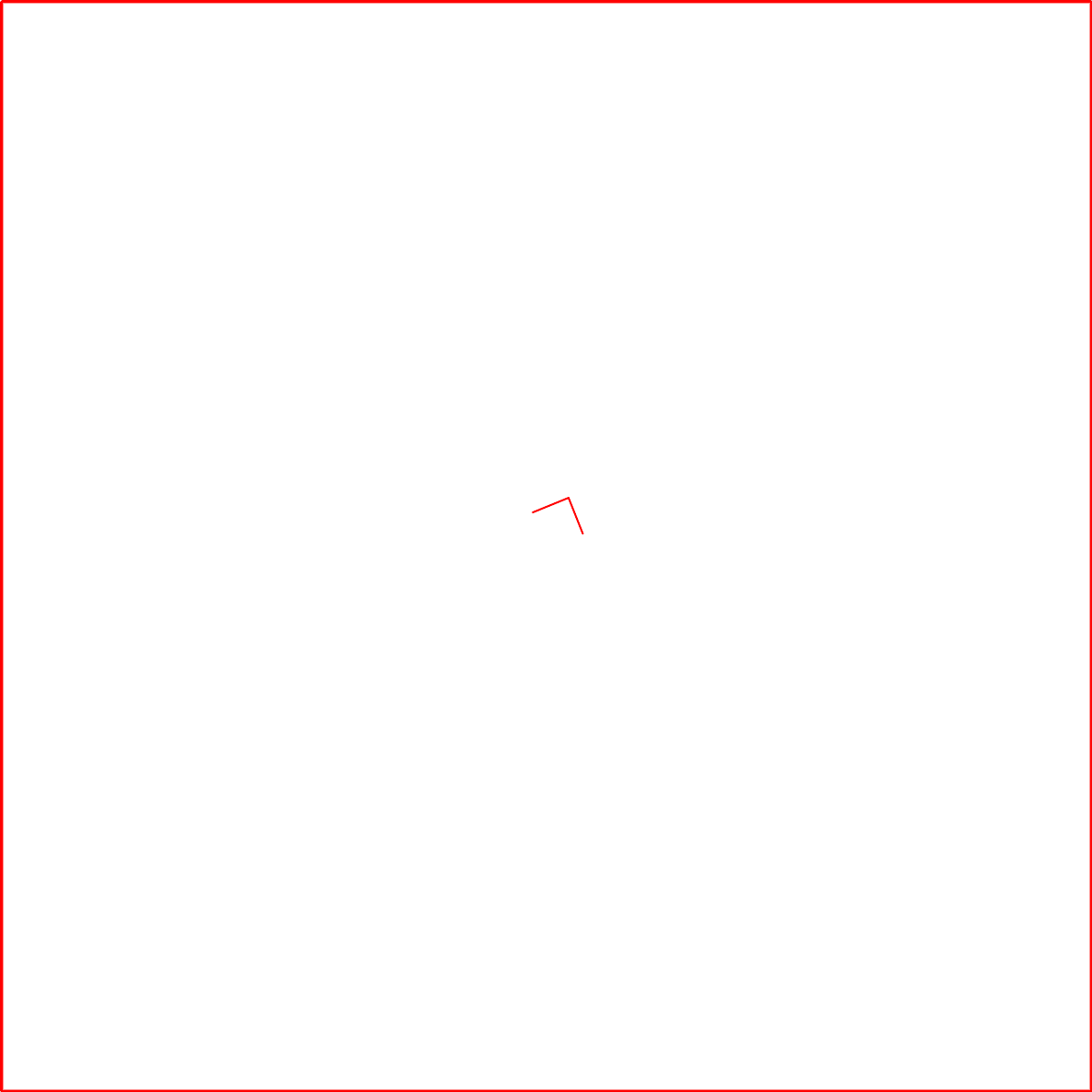
#### Student Task Statement

The image shows quadrilateral .



Apply the transformation rule to quadrilateral . What is the effect of the transformation rule?

#### Activity Synthesis



### 2 Make a Conjecture

#### Student Task Statement

1. Complete the table with the slope of each segment from the warm-up.

|  |  |  |  |
| --- | --- | --- | --- |
|  | * original figure slope | * image slope | * product |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |

1. The image in the warm-up is a 90-degree rotation of the original figure, so each line in the original figure is perpendicular to the corresponding line in the image. Use your slope calculations to make a conjecture about slopes of perpendicular lines.

### 3 Prove It

#### Student Task Statement

Let’s prove our conjecture about slopes of perpendicular lines for the case where the lines pass through the origin.

1. Find the slope of a line passing through the point and the origin. Assume the line is not horizontal or vertical.
2. Suppose the line is rotated using the transformation rule . Find the coordinates of the images of the points and the origin.
3. How does the original line relate to the image?
4. Find the slope of the image.
5. Compare your slopes. What did you just prove?

#### Activity Synthesis



#### Images for Activity Synthesis





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