Lesson Plan

Ruletation

Targets: Students will write the rule for a coordinate rotation of 90°.
SMP 3: Students will test the validity of another students conjecture (justify).

1) Have students individually identify the two transformations and write their rules before they discuss them with their group members. Use this time to clarify proper notation for the rules of transformations.

Translation	Reflection
$(x, y) \rightarrow (x + 4, y - 7)$	$(x, y) \rightarrow (x, -y)$

2) a) Allow students to explore the transformation and see that it is different from the first two above. Use the diagram to emphasis direction as well as degree. (e.g. 90° clockwise or +90°)

b) Having students write the rule here is the crux of the lesson, so don't give it away too soon. Ask them to commit individually on paper to a rule that will generate the given rotation. Don't be surprised if your class gives 10 or more options. List them all on the front board.

Then have students write their rule on a lapboard and *justify* it in writing. Once everyone has done this, have pairs of students exchange boards. (Front & back is best in this case.) Students are to read the person's conjecture and explain why they agree or disagree on the partner's board before returning it. Go back to the public list of conjectures and ask if anyone wants to eliminate some. The list should dramatically shorten.

3) Of those conjectures remaining on the list, have students choose one that they are sure is false and disprove it with a counterexample. (i.e. either with a drawing, or by substituting numbers)

Take another vote on the short list. Usually at this point students honed in on the correct rule. If not, demonstrate how you would mathematically determine the correct rule.

$$(x, y) \rightarrow (-y, x)$$

This would be a good time to have students summarize the targets, particularly on how they came to their final conclusion. Stress the use or instances and counterexamples to support or disprove a conjecture.

4) Depending on the time remaining, part (a) can be used as a ticket out the door, and (b) for homework and/or a warm-up for the next day.

Name _____

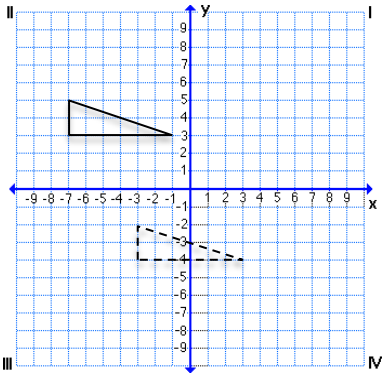
Ruletation

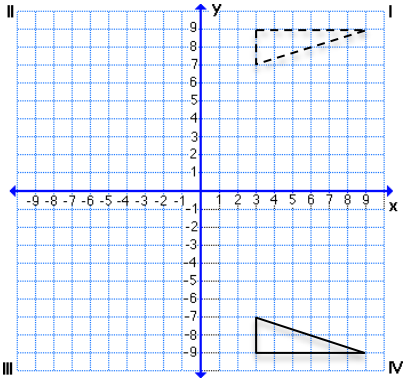
Targets: You will write the rule for a coordinate rotation.
You will test the validity of another mathematician's rule (justify).

1) For each of the following, name the type of transformation and state the rule

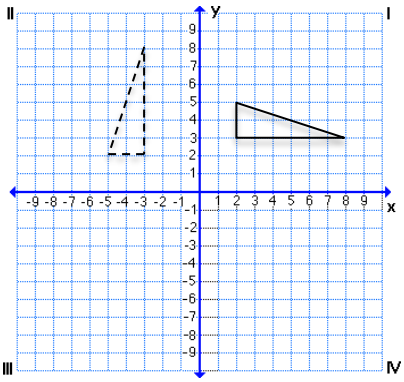
Type: _____ _____

Rule: _____ _____



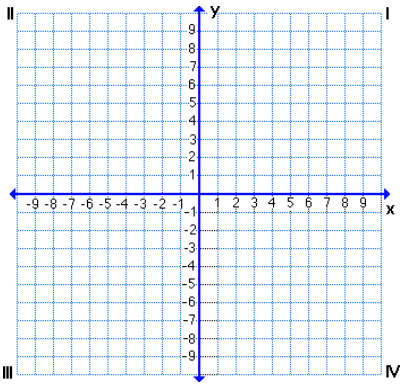


2) a) Describe the transformation to the right.



b) Write a rule for this transformation.

3) Write one rule offered in class that you know is incorrect. Show/explain why you know that it is incorrect.



4) Write a rule for a …
   a) -90 rotation:

   b) 180 rotation: