



**Rotation:**

1. Open the Geometer's Sketchpad file *Transformations.gsp*. Access the fifth section on Rotation (or choose the tab "Rotate" at the bottom of the page).

2. Click on "**Show Rotation of 90°**". What happens to the coordinates of the vertices of the figure after a rotation of 90°? \_\_\_\_\_

3. Grab any point and drag it around the screen. Does your hypothesis regarding the coordinates still hold true when a new figure is formed? \_\_\_\_\_

4. Generalize your hypothesis into a rule that will illustrate the changes in the coordinates?

Rotation:  $R_{90^\circ}(x, y) \rightarrow ( \quad , \quad )$

5. Highlight one of the sides of the original figure. Choose **MEASURE** from the toolbar at the top of the page. Choose **Length**. The length of the segment will appear on the page. Record this length. \_\_\_\_\_

6. Highlight the corresponding side of the image figure. Choose **MEASURE, Length**. Record this length. \_\_\_\_\_

7. Do the sides of a figure maintain their lengths through a rotation of 90°? \_\_\_\_\_

8.. Click on "Hide Rotation of 90°." Click on "**Show Rotation of 180°**". What happens to the coordinates of the vertices of the figure after a rotation of 180°? \_\_\_\_\_

9. Grab any point and drag it around the screen. Does your hypothesis regarding the coordinates still hold true when a new figure is formed? \_\_\_\_\_

10. Generalize your hypothesis into a rule that will illustrate the changes in the coordinates?

Rotation:  $R_{180^\circ}(x, y) \rightarrow ( \quad , \quad )$

11. Highlight one of the sides of the original figure. Choose **MEASURE** from the toolbar at the top of the page. Choose **Length**. The length of the segment will appear on the page. Record this length. \_\_\_\_\_

12. Highlight the corresponding side of the image figure. Choose **MEASURE, Length**. Record this length. \_\_\_\_\_

13. Do the sides of a figure maintain their lengths through a rotation of  $180^\circ$ ? \_\_\_\_\_

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14. Click on “Hide Rotation of  $180^\circ$ .” Click on “**Show Rotation of  $270^\circ$** ”. What happens to the coordinates of the vertices of the figure after a rotation of  $270^\circ$ ? \_\_\_\_\_

15. Grab any point and drag it around the screen. Does your hypothesis regarding the coordinates still hold true when a new figure is formed? \_\_\_\_\_

16. Generalize your hypothesis into a rule that will illustrate the changes in the coordinates?

$$\text{Rotation: } R_{270^\circ}(x, y) \rightarrow ( \quad , \quad )$$

17. Highlight one of the sides of the original figure. Choose **MEASURE** from the toolbar at the top of the page. Choose **Length**. The length of the segment will appear on the page. Record this length. \_\_\_\_\_

18. Highlight the corresponding side of the image figure. Choose **MEASURE, Length**. Record this length. \_\_\_\_\_

19. Do the sides of a figure maintain their lengths through a rotation of  $270^\circ$ ? \_\_\_\_\_

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20. Access the fifth section on Rotation Any Angle (or choose the tab “Rotate Any Angle” at the bottom of the page).

21. Click on the circle at the top of the right hand side at point R and move the point. Watch the rotation of the triangle. Do your observations support your formulas stated above? \_\_\_\_\_

When you close the program,  
do **NOT** save the changes.  
By **NOT** saving the changes, the program will remain in its  
original state with the original settings.

